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EuroInfo 91: Policy Issues

Plus

Library co-operation on a European scale

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Aslib, The Association for Information Management has some two thousand corporate members worldwide. It actively promotes better management of information resources.

Aslib lobbies on all aspects of the management of and legislation concerning information. It provides consultancy and information services, professional development training, specialist recruitment and publishes primary and secondary journals, conference proceedings, directories and monographs.

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Introduction

Aslib is delighted to have run Euroinfo, the first information management conference in Poland. This was at the invitation of the Business Foundation of Warsaw and with the support of the British Council and the Commission of the European Communities.

The conference was run on the 21 and 22 June 1991 along with a three-day trade fair where some 25 companies, including Aslib, exhibited.

The keynote paper was from Roger Bowes, Aslib's Chief Executive who concluded his paper with a message of support from the Prime Minister, the Rt. Hon. John Major, which the Secretary of State for Trade and Industry had asked Aslib to convey to the conference.

There were four sessions of papers followed by questions and answers:

P, 7129

Policy issues
European relations
Information management
Access to information

Policy issues, the first session, is featured here. The other sessions will appear in subsequent issues of *Aslib Proceedings* in February, March and April.

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Welcome to EuroInfo 91

Bogdan Chojna
President of the Business Foundation

I would like to welcome you with real pleasure to the first annual Euroinfo event. The idea of this venture originated last year in October in London at one of the conferences organized by Aslib, that is the British Association dealing with the issues of information and its management. Together with Mr Roger Bowes, the first speaker at our conference, we came to the conclusion that at present, in a time of quite dramatic transformations taking place in Europe, in a time of integration of the East with the West, the problems related to information have come to the fore. The lack of a system of economic information in Poland is one of the reasons why foreign capital is slightly slow to invest or does not show enough enthusiasm in investing in our country. That is why every step taken to create a system or systems of information and its management is of vital importance.

Steps of this kind are undertaken individually by various organizations or companies, among others by our company, The Business Foundation, which deals with business information management. We have a considerable database and publish the book which gives basic information about Poland as a country of investment and also gives a list of companies it is worth doing business with.

We believe that without a properly organized system of information about the state of the Polish economy, economic reforms on a national scale are not possible, and without organized internal information about companies, the transformations within them and their development will certainly be delayed.

The presentation of both a Polish information policy towards outsiders, as well as the techniques of information management throughout the country and the technology involved in the transformation and transmission of information, seemed to us issues urgent enough that we thought it advisable, or even necessary, to initiate this meeting which you are now attending.

The time appears to be especially suitable in view of the forthcoming treaty of association between Poland and the EEC. Our companies, and also our politicians and social activists, will soon have to become familiar with an unprecedented mass of information. Mr Jaroslaw Mulewicz, the main negotiator of the treaty of association between Poland and the EEC, mentions that there are several thousands of EEC norms which will have to be assimilated in Poland in order to be able to think realistically about integration.

So in view of this European need for information we asked for the assistance of an EEC department, EUROP, that is the EEC Official Publications Office.

Mr Serge Brack, one of today's speakers, will be able to present issues concerning information both by virtue of his office and on behalf of other departments. We will soon find out what departments these are. We have been co-operating with Mr Brack and his office for some time now since the Business Foundation is the representative

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of the EEC Official Publications Office for Poland. The fact that the University EEC and European Studies Centre headed by Professor Wieczorkiewicz joined the list of the organizers forms another Polish-European accent.

The international circulation of information requires great effort on the part of the translators and interpreters. Without them today's meeting would at least be made more difficult if not impossible to organize. That is why The Association of Polish Translators and Interpreters is also among the organizers. This splendid gathering is enriched by an international Translator's and Interpretors' Agency, INTERVERBUM, which is based in Stockholm, and the British Council, an organization which does need recommendation to the people interested in information. Owing to the common effort of the organizers, we are able to impart the point of view of both the Polish economic leaders as well as Polish ministers, MPs and representatives of the local government with regards to the needs in the information field, particularly economic information.

We can also present the newest technologies and means of gathering and transformation of information such as infomapping, online services, CD-ROM, computer aided translation etc. These will be the subjects of today's and tomorrow's presentations. We will also deal with real examples of utilization of information, or rather transformation of information, in the specific companies such as Pewex, which is now introducing Sun computers in the network of their retail shops or the well-known Polish National Census System – Pesel. For many of us the latter brings negative associations but at present it positively supports reforms of both the insurance and taxation systems through co-operation with IBM. The all-Polish electronic mail systems TESA and POLKOM will also be presented.

One of the extremely interesting or even predominant items at this conference and exhibition will be the opening of BC-NET, that is the Business Co-operation Network in Poland, presented for the first time outside the 12 countries of the EEC. It appears to be a most important and professional system, which will act, as it were, as a matrimonial agency for companies. Poles who are familiar with the system as well as the representatives of the EEC consider it to be an event of great importance.

Euroinfo is going to be an annual event and that is why I would like in advance to invite you to Euroinfo '92.

The commercial part of that event, that is the exhibition, will have a wider or even mass appeal and will be located in a more spacious place, in the Palace of Culture. Next year the conference will focus mainly on the issues of European integration in view of the fact that it will be the year 1992. Today, on the other hand, we will concentrate on the subject of co-operation, especially economic co-operation. However, before we Poles begin to view ourselves as an integral part of the EEC let us try today to assume a more businesslike course of action and concentrate on the subject of information as a branch of the economy. It is about this that our lecturers will be speaking today and tomorrow.

I would like therefore to give the floor to our speakers and suggest that Mr Andrzej Kopczynski be charged with the duties of chairman. Mr Kopczynski is a Warsaw University lecturer, an eminent translator and a teacher of translators. If you do not have any objections against this proposal let me declare the Euroinfo conference opened. Thank you very much.

The Fourth Resource

Roger Bowes
Chief Executive of Aslib

The last time I stood on this platform was in 1978 and you were the *People's* Republic of Poland. There was little optimism then that anything would ever change.

It is an honour and I am delighted to be back 13 years later in the Republic of Poland.

Talking of dates, on Easter Sunday 1989, Peter Drucker, the distinguished Professor of Politics and Philosophy, and Professor of Management, wrote in his book *The new realities*:

> If the nationalist unrest in Russia spreads to its satellites in Europe and causes serious trouble in Hungary, Poland, Czechoslovakia or East Germany, a military excursion into Western Europe might well tempt the generals of Russia as much as such an 'excursion' tempted the generals of Austria in 1914.
>
> We need to maintain both the political unity of the West and its military preparedness. We need to be ready for a total change in the East's relationship with Western Europe. It would almost certainly be the end of NATO and of the American-European Alliance altogether. It might require military neutralization of Central Europe.

180 days later Poland had its own government. 220 days later the Berlin wall was a relic.

They had not made a military excursion into Western Europe. And the almost certain end of NATO has not happened; we have not seen the end of the American-European alliance or the military neutralization of Central Europe.

I don't have to remind you, the players in this drama, that we are barely two years on from Easter Sunday 1989.

How could he have been so wrong? So wrong about what Russia might do, and perhaps more significantly what it could do.

Drucker and others observe on the many failures in national policies or business strategies and the consequent costs, in countries possibly by way of lives and wealth, in business of jobs and wealth, from not managing information.

How could his *information* be so wrong? Or was it his *interpretation*? Was it the *management* of the information that he got wrong?

The management of information is the key to success in business. Equally, for nations it is the key to economic strength and national security.

The lessons seem manyfold. Are Gurus any better than politicians at calculating what people and nations might or might not do? It shows that you cannot have enough information, indeed it suggests that he was seriously lacking in information, and that interpretation and management of it is critical; the world and its infrastructure is increasingly unpredictable.

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It is now accepted that most, if not all, of the great economic panaceas or formulae have created exactly the opposite of what they were intended to achieve. I hope that Mr Balterovich is more successful for you.

In the last page of his book, Drucker quotes Descartes, 'I think therefore I am', and suggests he would now have to say, 'I *see* therefore I am'. Since Descartes the accent has been on the conceptual, but increasingly we will balance the conceptual and the perceptual. Drucker's new realities are, as he puts it, configuration and as such calls for perception as much as for analysis.

But hasn't he shown how much easier it is for us to get perceptions wrong as opposed to analysis, as indeed he did with his perception of the implications of the breakup of the Russian Empire?

Peter Drucker draws our attention to the codification of the new world view of knowledge which dominated Western philosophy for more than a century in Immanuel Kant's *Kritik der Reinen Vernaft* (*Critique of pure reason*) and contrasts this with how contemporary philosophers deal with configurations, i.e. with perceptions as much as analysis because we now have to cope with disequilibrium and transnational and multinational economies and ecology, not to mention interdependence. All the things, incidentally, which were fundamental to the breakup of the Roman Empire.

But surely the greatest change is to change itself. Now discontinuous change is the order, or should I say disorder, of the day. I have also drawn on Descartes in that the Cartesian model of exact calculation and movement is being superseded in some critical respects by Heisenberg's uncertainty principle, which suggests that observation alters the state of the phenomenon, so that the behaviour of an experiment and the outcomes are changed in some significant way.

This shift in fundamentals is a challenge to science and knowledge and therefore a challenge to the knowledge-based industries.

To put it another way, the decimal points of high Cartesian precision are giving way to the blurred or fuzzy sets of Heisenbergian recall. Prediction is abdicating and probability is gaining the ascendancy. Information science is, I would suggest, becoming vulnerable to alternative information science as a discipline.

I want to focus on the issues that are becoming significant as we move into the new millennium rather than on current, but transistory, problems.

In the eyes of previous generations, all change has been for the best, and growth has meant more of the same. Edmund Burke put it powerfully, 'A state without the means of its conservation'.

By contrast, the kind of change we are encountering 'beyond the stable state' may be discontinuous. The dramatically exciting re-emergence of the Polish nation is the foremost example. Old forms and formulae that once served us well will not work any longer. Uncertainties will predominate. Conventional wisdom will not be enough, and we need to adopt a pragmatic approach.

Ad hoc methods to deal with complex and unpredictable circumstances will make life harder. We are all seeing and feeling this now as individuals, as groups, as professional bodies, as nations.

In the past we Europeans have built our lifestyles and careers on tradition. We have developed our social and economic values over a long gestation period, and we have resisted change. We have held onto conventional social and economic values for security.

Sometimes we have favoured traditions of co-operation and social democracy, at other times we have fostered a generational effect among people and business, one of individualism, competitiveness and enterprise. Neither will suit the future, and I have a strong feeling that a fresh social and professional vision will inform the next century, and affect our opportunities and indeed our careers.

We are in a period of discontinuous change, a state of being which the Americans will no doubt find more comfortable than the Europeans. We should, indeed we must, study the new spirit and the fruitful opportunities it may bring.

Discontinuity will be the normal course of our lives, and we will need to adapt to the opportunities or be passed by.

Defining purposes

May I suggest to you that we focus our attention on the beneficial use of information and on the environmental issues that are becoming crucial to survival. We must give our attention to the economic and social impact of our work on our clients, on the employers we serve, and on the communities which these changes will affect. Above all, we must maximize our potential to influence the future of the issues that concern us in our countries and the world at large.

There is a vista of opportunity for Poland, in which there will be prospects for you to reap rich rewards. Yet, as the promised harvest time draws near, you will need to devote time to clarifying and simplifying the themes that should inform your work and your professional lives. Equally, you should look into ways in which you can acquire more knowledge and fresh skills within formal systems of education and training, and outside those formal systems. You should try to unpick the deep issues.

It will not be enough to be expert in your discipline and your profession. In the years to come and particularly in times of recession and discontinuity you will have to convince others of the value of intellectual capital and the benefits and revenues you can generate individually, corporately and nationally.

You must answer key questions:

- How are you going to refresh and regenerate your professional skills? (– Aslib!)
- How are you going to persuade the best of your countrymen and women to apply themselves to the development of your information resource?
- How are you going to exercise influence in the corridors of European power, where it will matter? Our conference today is contributing to that.
- Above all, what steps can you take, so that information science will make the fullest contribution to the resolution of the problems, the deep issues that will beset your society now and into the next century?

Let me now try to say something about these deep issues. In brief, I think we have reached the end of the primarily market-driven economy, with which many of us are entirely familiar. The world, and particularly your world, is aiming to create a better environment and a social environment in which people would want to live, work and pass their free time. Even though many of the enabling tools are not yet in place in Poland, or even in prospect.

Market forces will become important to provide the stimulus for competitive behaviour and to bring a vital element of realism to choices and decisions. But we will need to bring many more factors into our calculations.

Now the tide is turning, seekers after truth have moved towards a different model for their work.

It seems that mankind and womankind are not masters and mistresses of their universe to the degree that scientists once assumed. Just as central is the realization that our world is not merely a mechanism, it is a set of modular systems, and these systems are interdependent.

When we try to view and analyse these systems, maybe there will be a place for what we might call an holistic approach to information science/management, rather like the holistic approach to medicine ie, alternative medicine.

In alternative medicine, instead of treating the specifics of the disease the practitioner treats the whole person. In our field instead of dealing with the specific enquiry of problem, we might focus on the enquirer's situation, the total environment in which he or she operates. What does this mean in practical terms? I suggest it will no longer be enough to deliver data or information or text. In response to a question we must deal in knowledge and offer advice and counsel. The whole should be greater than the sum of the parts.

We are trying to apply this philosophy ourselves. Aslib's customer interface with members and clients is not anymore the recruitment consultant answering a job enquiry, the librarian finding a reference, or the trainer manning a course. In our One Stop Information Shop we adopt a broader remit. We seek to deploy perceptive information science to convey meaning and greater understanding where it was lacking, to change attitudes, and to develop opportunities and fulfil them.

At Aslib we are convinced that the future will lie with information scientists and workers who are masters of change, who can alter behaviour and accelerate the process by which ideas and inventions are grasped and transferred into profitable and effective practice, by which knowledge is put to use.

May I suggest that you need a similar approach as you face the challenge of change?

In an era of competition you will need dynamism in forward thinking and action. You will need clarity to see and seize your opportunities; you will need energy to update yourselves and your profession, or others will overtake you.

But how much will this revolution cost?

Money, of course, buys everything and therefore all the resources a corporate entity or a country needs to prosper and compete can be bought. But Poland does not have a lot of money. The $1 billion stabilization fund, impressive as it is, is no larger than the annual turnover of many of our larger businesses.

What should Poland spend its hard won money on when there are so many priorities?

Let us look at the three key resources: Property, Natural Resources and Human Resources.

Property is an expensive resource if you need to invest. Of course, it becomes a highly valuable resource if you have it. In the case of Japan in particular, the ridiculously high value placed on property has been the main driving force in the international financial markets. A collapse in this bubble could have a devastating effect on markets and on confidence creating a recession, the like of which none of us can imagine, but that's another story.

Natural resources, the raw material of manufacturing, are expensive but fortunately Poland is well endowed. Similarly, Poland is well endowed with human resources, and this in turn is still a relatively cheap resource.

Another relatively cheap resource is information, the fourth resource. It is the essential element necessary for your human resource to turn knowledge into competitive production of your natural resources, and into property. To me, this is clearly where you should spend your money.

But, of course, you will be concerned, as indeed everyone in the developing countries is, about the enormous advantage the West has and the seemingly insurmountable job of catching up. I think you can (catch up).

In fact I think, preposterously, that you can move ahead of Western information status and compete effectively. Because not only is information cheap, but on the whole the West does not yet consider information status to be a priority.

To me this is your major opportunity and by far the greatest potential to add value to your newly gained financial resources.

By using what we refer to as information refineries you could move ahead of your international competition in the fields where you can maximize upon resources which Poland already enjoys. Let me explore this further with you.

Because we believe at Aslib that the West does not consider information to be of a high enough priority, we have set as one of our major objectives, indeed almost as a mission, the development and evaluation in the corporate consciousness of the importance of information as a strategic resource, as capital, and as the essential element in decision making. What are the fast ways for you to catch up and move ahead? As part of our package of activity, which we hope will involve the Confederation of British Industry, we have launched a journal aimed uniquely at this market. It's called *The Intelligent Enterprise.*

In the latest edition Professor John Myers of Solon, a leading information consultancy, draws our attention to a piece in the influential American magazine, *Fortune*, by Thomas E Stewart. His theme was 'brainpower' – the intellectual capital that he said is 'becoming corporate America's most valuable asset and can be its sharpest competitive weapon'. Stewart believes that 'the idea is plausible and appeals to many chief executives'. Among others, Stewart quotes Dr P Roy Vagelos, CEO of Merck & Co, the successful pharmaceuticals corporation, 'A low-value product can be made by anyone anywhere. When you have knowledge no one else has access to – that's dynamite.'

How best can you capitalize and leverage these assets? One approach is to employ an expert who can manage the corporate knowledge portfolio. It will extend to the experience that resides in the company's people, the knowledge that lies in the company's documents, and the intelligence that can be drawn in from external sources. There is a finance director to manage money, a personnel director to manage people, and an estates director to make the best use of land and buildings. Why not a Director of Intelligence to translate intellectual capital into competitive power?

Stewart proposes a tally of corporate skills, and intellectual capital built into products and machines. He implies that CEOs should encourage people to share what they know to give the company an edge, not save it to give themselves status.

I have briefly outlined how The Information Capital of a corporation or indeed nation might be managed, indeed discovered.

But there are mechanisms or systems which can be outsourced to achieve this. Aslib's One Stop Information Consultancy package is actually called ASSESS and it enables you to access the corporate knowledge portfolio. Tomorrow you will hear from Woody Horton and Bob Norton how to use Infomapping to discover this resource.

Another new idea for using intelligence efficiently and therefore faster and cheaper is Just-in-Time (JIT). JIT has worked well in manufacturing and in distribution. The question is, can it give companies a head start with intelligence? What steps could you take to use intelligence Just-in-Time? To begin with, you should close the in-house stores of paper and data, most of which are no more than clutter that no-one will even look at again – at least, not until the 31st century when industrial archaeologists start to disinter it. Instead, companies can shred copies, or wipe them, and hand over their dockets and discs to specialist refiners, who will do several tasks as an internal or external service. Refineries will sift the core of fact from the pulp of verbiage, and store what the company may need for use or evidence in the future. Refineries will extract intelligence that tells the CEO, and others, who knows whom, who knows what, and what they know. The refiners should sell off anything of value that the company doesn't need to keep to itself.

Maybe, as voice recognition systems improve, the refiners can apply the same approach to phone calls and meetings. Maybe, when expert systems advance well beyond their present state, both refining and rapid retrieval routines can be automated. Meanwhile, the refiners must apply great skill and judgement to exploit sources from within the company and beyond it. They'll need to reassure CEOs that the innovative approach will not risk the company's security, survival and capability of using intellectual capital to its advantage.

Experience of Just-in-Time Systems

The literature on JIT points to ideas that might apply to JIT intelligence. One useful source is Zipkin's paper in the *Havard Business Review*, January-February 1991. Another is *Industry Week*, October 1990. In the latter, John S McClenahen shows how JIT in manufacturing can lower costs, boost quality, tap into growth markets, and draw supplies from global sources. He also says that JIT is 'fraught with risks and frustration', partly because there are chances of 'sudden and catastrophic cut-offs'. On the other hand, those who make it work reduce lead times. They save on stocks, inventories and costs, and secure quantum leaps in their return on capital employed. Properly developed, JIT intelligence could offer comparable benefits.

These advantages could extend to small businesses, as Manoochehri suggests in the *Journal of Small Business* (vol 26, no 2, October 1988). He gives a clear definition of JIT:

> JIT is characterized by the "pull" approach as opposed to the conventional "push" approach. In the "push" approach, orders in large lots are released to the first work station in the shop. When completed, the job is sent to the next work station, if shop floor space is available; otherwise, to the store room to wait for processing. This process continues to the final assembly, resulting in loading the shop with a lot of work-in-progress inventory ...
>
> In the "pull" approach, a work centre withdraws the required items for its production from the preceding work centre. Then the preceding work centre produces the exact quantity needed to replace the withdrawn parts, and withdraws its required components from the preceding work stations. This approach works backwards from the final assembly, and goes back up-stream to all preceding work centres, including suppliers and vendors. With this approach, an order is triggered by the need of the following work centre, and no unnecessary item is produced, decreasing the inventory.'

Modified Data Warehouses

John Myers of Solon Consultants suggests a similar idea that could be organized as the root of JIT intelligence systems, the 'data warehouse'. Briefly, it extracts data from programs or processes. At present, users often embed data in files they create with the software that they apply to process the information. Increasingly, many processes may call for the same data, which the user has to export and import between packages. By applying new standards and inter-linking the data in the 'warehouse', these processes can feed from the same data sources, which should mean greater consistency and efficiency. By making sure that intelligence is drawn just in time for the next process from the preceding one, the company could minimize its stocks of unused and unusable intelligence.

These ideas that I have discussed with you this morning are relatively inexpensive to put into place, but can crease an enormous multiple of added value to your enterprise.

Poland has a formidable task ahead of it but by utilizing the fourth resource it can achieve its goals much faster at the small business level and at the national level.

Information capital is the most important corporate resource today. Poland also has advantages in securing or maximising this resource. You have a clear sense of purpose, you have the need and desire, you have an innovative human resource. I believe that you are more susceptible than you might think to the notion and indeed the reality that the fourth resource is the most valuable resource of all. Finally, I told our Prime Minister, John Major, of the British Council, Business Foundation, EUROP, Aslib and Polish Translators Association conference and through the Right Honourable Peter Lilley MP, Secretary of State for Trade and Industry he sent you this message:

Demonopolization, privatization, industrial restructuring and modernization are fundamental to the transition to a market economy and essential to fostering domestic competition and improving competitiveness in world markets. The UK is pleased to be helping Poland to make this difficult transition by contributing to international financial support and bilaterally through the British Government's Know-How Fund. Information management is an area in which the UK has considerable experience and expertise. I commend the readiness of Aslib, and other British organizations to advise and to help provide the technology required to speed modernization.

Financing European projects and access to funds in Poland

Alexander Dijckmeester
Head of the delegation of the Commission of the EC in Poland

The importance of information in making correct decisions. That was what the Business Foundation asked me to talk about in general. Now the statement is so obviously true, that information is of crucial importance in making correct decisions, that I would have hardly dared to talk about it. It is a matter of immediate importance when information decisions have to be made and when one sits around to talk about investments, which is the most crucial information decision that one can make in business life.

I must admit that I would have preferred to be here more as a listener than as a speaker because I do not know very much in detail about the issues dealt with during this conference except that they all seem to be of extreme importance. I am certainly no specialist in information processing, in electronic translation, in information systems and the like. I only hope that these means of transference will be in their place soon, the sooner the better, and that this conference will contribute to a better and more comprehensive flow of information between Western Europe and Poland for the development of a market-oriented society. I certainly think that the Business Foundation must be complimented for their foresight in holding this meeting.

I have a philosophy about information and I would like to very briefly tell you what it is. I think that there is a lot of misinformation about information and that is a tricky thing for a businessman. There is a lot of information that is not quite correct, it is not obviously always false, but it is not sometimes completely correct, it is not complete and it is a thing that is tricky because so much depends on it. To give you an example, you got an invitation today to come to a conference and one of the speakers there would have been my Vice President, but I must disappoint you, I am only the Ambassador here in Warsaw and not my supreme boss in Brussels who apologizes and wishes you, Mr Chairman, all the best for this conference.

There is a book, the *Penguin book of lies* which gives an excellent survey of the phenomenon of not telling the absolute truth. It starts with the well-known story of Jacob posing as Esau in front of their blind father Isaac in order to get the rights of the first-born son.

As the previous speaker told you, the business and government environment changes rapidly and information becomes obsolete very quickly. I think that is the most crucial thing that we all have to cope with, whether we are in business or in government. It means that business and government have constantly to review their decisions because the facts, that is the information on which they are basing the decisions, are changing. What seemed a rock of certainty after a while turns out to be drifting sand and investments can no longer be based on that.

For a businessman in Poland, whether he is coming from the outside or whether he

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is a Polish national based and working here, there are several sources of information available and all are changing. If we take the government information, if we talk about the laws for instance, we have the foreign investment law which has passed the Sejm and will go to the Senate which will come about soon. It is a good law I am told, but it is not quite there yet, and the old law is still in place. Then there is the law on reprivatization which should come soon and would add mightily to the feeling of certainty of international businessmen when they come to this country knowing that there is a basis, a legal basis, on which they can talk with Polish citizens on property. And then there is the issue of land ownership. It is, I understand, in place, but perhaps changing. One has to go to the Ministry of the Interior to find out whether one can invest in land as a foreigner. These are just a few examples and there are many more. The Polish government is trying to get in place, perhaps quicker than originally envisaged, a series of Bills that could speed up certainty, but it is a matter of concern that certain key issues are not yet decided upon, although they will be soon.

Take the Central Statistical Office. That office is at present better at gauging government trends and facts than it is on information on the private sector, because this information is not very quickly available. The environment and the sector changes mightily and the techniques of the Central Statistical Office are not yet completely adapted to give a good picture. It is a very important thing because most of the statistical information on Poland comes from the Statistical Office and what people look most at is how the private sector is changing. It is not only the downfall of productivity and output in the state's industries, it is also the gross of the private sector that is going there. Are we not getting a picture which is too gloomy?

There are other factors more for the future. In Poland there will be a set of business centres, which are quite ambitious schemes to set up business centres all through the country that will advise businessmen in Poland on decision making. We are at the very beginning of this and it is hoped that these centres will be set up and that some will be established overseas. There will probably be 20 information and promotion centres set up at important overseas trade centres so that foreign investors will know about Poland.

Then there are business organizations such as the Chamber of Commerce, which still has a long way to go, but it's going to improve its information centres mightily – it has a very ambitious programme. And then there is the Employers' Federation which still has to find its legal base. The Employers' Federation still has to be legalized and to organize itself, but will be of great help to all Polish businessmen. It won't be long before its fully active.

I am sure that in the field of the trade unions the same is happening. I have the feeling as an outsider that there is a lot going on there, perhaps an orientation away from the all too political emphasis of the past into the management of the interests of their members, but again it is ongoing. And then there are trade organizations, although these are still in their infancy. Trade organizations in the different sectors, which are so useful in all the Western countries, have hardly sprung up in this country.

So all these factors, all this information is in the process of being *set up* – it is not all there, not fully fledged. It is highly important to realize this because that is the framework that western businessmen operate in and that is the framework that will come into place in Poland. And then there of course are donors, 8 donors. Minister Ziosolvski has his office here, a co-ordination office in the Council of Ministers. Polish and foreign businessmen would be well advised to pay them a visit because they have the overview of what's going on, what's coming from abroad. Then of course there are the individual donors. The most important ones certainly merit a visit, you can knock on their door and they will tell you what you want to know.

If, as a consultant, you want to get a job you go to the donors and you go to the technical ministries, and then on the other side the suppliers and contractors. They have to get to their jobs by way of looking in the *Official Journal* in all the member states countries and the advertisements in the Polish official newspapers on tenders and open tenders that are being made according to international standards. That is, very specific donor-related information that is open to all of us. Our EC Embassy has an information centre which will soon be opened and which will be open to the public. The Business Foundation here has on sale all the documents that are issued day by day from the European Community and our Business Information Centres all over Europe that are available to the public. There are also technical and research centres in Warsaw specifically geared to the EEC.

A business person is operating in the changing context as we said. If you look at the European Community, there is something very interesting going on, but the outcome is not clear. Two trains have left, one being a political train, a political integration train, and the other is the monetary train and they will all end up somewhere pretty soon and there will be a new treaty. The European Community will be different to what it was and Poland wants to become a member, as we surely will. You will find that you have become a member of a completely new organization to what you thought you were going to be a member of and once you are a member you will contribute to the changes that will come. Poland as a country has to find what its comparative advantage is and that is not necessarily the advantages of the past, it could very well be, for instance, that tourism is one of the important sectors where Poland could find a niche.

Poland faces the collapse of its trade with the Soviet Union and nobody knows what Mr Gorbachev will propose to the industrial countries in July. We will not know yet what the West is going to answer and then again we do not know what the role, the interests of Poland, will be in a new deal, in a new relationship between the West and the Soviet Union. Certainly there will be advantages for a business person. The first thing, and always the first thing, is to define your market — it is not easy, but you have to get out there. What business people have always done is know their product, or so they think. They know their market and if they do not they will find out to their chagrin that they do not, but they will refine their knowledge of the market. Market is a new word, but it is a word that has to be learned the practical way with all the information at hand and with all the misinformation available. They will have to go out and they will find out more about selling their product.

There are opportunities for joint ventures – there are interesting joint ventures that can be made between Western companies and Polish companies. There is training available – EEC training and other training.

Let me as a last point mention our exercise in joint ventures and foreign investment

Poland in the perspective of global change

Antoni Kuklinski
Vice-Minister of Foreign Affairs

My task is particularly easy because in the white plastic case you will find a blue booklet which is the basis of my speech. May I please ask you to refer to this book it that is possible.

The revolution which has taken place in Central and Eastern Europe, which is taking place now, is a subject of great interest to world science. Eminent representatives of social, economic and political sciences comment upon this phenomenon which belongs to one of the most interesting in the 20th century. It seems that there are four ways in which one can view Central and Eastern Europe.

Firstly there is the factographic view, that is the ordering of facts. The point is that facts are not straightforward. To begin with we all know that in our countries cases of destroying and concealing documents takes place. It seems to me extremely important which of these factographical documents will become the subject of historians' consideration.

Secondly, facts are always associated with interpretation, evaluating statements. So even this simple task of ordering our factographic knowledge is not simple. Next is the problem of explanation. We observe events around us and try to explain why they occur. We try to answer using the conventions of various scientific disciplines such as economics, political science and sociology. However, it appears to me that the most important is the global view which in my foreword I call holistic. The point is to show the interaction between political, social, economic and cultural factors. If you watch what is now happening in Poland a holistic view is especially important.

The next issue is that of forecasting. It is relatively easier to explain the past. And it is interesting that in Central and Eastern Europe the forecasting trend is relatively poor/ weak. We are able to say relatively little about what can happen in six months, a year or 10 years' time. In the meantime in the EEC, in Bruxelles the studies on Europe 2000 are born. The studies concentrate on the 12 EEC countries only. Central and Eastern Europe ought to be incorporated in those studies – our voice must also be heard.

And finally, the last issue is that of expertise and generally of consultancy work. Science can contribute to the solution of current problems. And we realize that we are very poor at it (consultancy). On such premises, the Polish Association of the Roman Club, the University of Warsaw and the European Institute of Regional and Local Development prepared a book which I would like to draw to your attention. It appears that in the discussion which attempts to explain what is happening in Central and Eastern Europe our voice must also be heard. Here is a book attempting to present Polish problems in the perspective of global changes. It seems to me that the flow of information must occur in both directions. It is not only us that have to absorb information about the EEC but we also have to provide thorough information on what happens in Poland.

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The book consists of three parts. In the first part there are references to the discussion on the global economy, especially to a well-known book by Professor Porter, *The competitive advantage of nations*. The book presents an attempt at interpretation of the meaning of Prof. Porter's views in Polish conditions. The second part is an attempt at an interpretation of overall economic and political changes in Poland. I believe it is an interesting attempt. And finally in the third part Prof. Szczepanski makes an attempt to interpret political and social transformation in Poland throughout the 20th century. We will make efforts so that there is a continuation of this volume and so that we can obtain a complete interpretation of how Poland searches for its new, stronger position in Europe and how, on the other hand, it presents itself to the competitive advantage of Poland at the turn of the century.

Finally I would like to draw your attention to one more issue. If we look at the map of the world, at the way in which countries, regions and settlements are related and what place they find in the perspective of global changes we can perceive three categories.

First, there are innovative countries, regions and towns. It is a small/narrow group creating innovations on a world scale and it is the engine of history. One has to observe that in every era, whether it be the age of the first industrial revolution or that of the Silicon Valley there is always a very limited number of towns, regions and countries which act as the engine of change.

The other group is that of adaptive countries which through diffusion take over what others did and adapt this for their own needs. Spain is such a classic example of a successful adaption.

And finally there are countries like the Scansen museum, resembling a live monument of the past, because the opposition to change is so strong that those countries for a long time lost their relatively favourable position in the world. A country of this type is Argentina, which as you remember was on the tenth position on the GNP list in 1910 and at present is on the 60th position. Let us ask a question regarding the position of Poland. If we don't limit our interpretation to economy only and at the same time look at political and cultural issues, then Poland is at the same time an innovative, adaptive and Scansenlike country. It is undoubtedly innovative in the sense that the Solidarity Movement was a novelty in history. It was a great political novelty. And the appearance of the Solidarity Movement was an important novelty in our country, and in Central and Eastern Europe.

Poland is undoubtedly an adaptive country. And here we face an enormous task, which was discussed here in this room, of Poland's adaption to the general changes (taking place) in Europe.

As we watch certain phenomena and witness barriers in the social life in Poland, it can be seen that Poland is undoubtedly a country in the shape of a museum. Sometimes in my nightmares I can see the similarities between Poland and Argentina – that is how we are losing our relative position in the global economy.

I would like to encourage you to have a look at the contents of this blue booklet and consider in what way Poland could find its diamond, that is, the determinant of national competitive advantage, a term created by Prof. Porter which says that every country has to find a certain group of factors determining its competitive ability in the world

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The role of information in Poland's industrial reforms

Andrzej Zawislak
Polish Minister of Industry

Ladies and Gentlemen. The announced subject is extremely broad and there is a risk of uttering commonplaces, because I could just say that information is important and then try to prove it in various ways. I would like to go beyond the scope of this subject, however, and touch upon issues which we, in our department, consider to be important.

Generally speaking information is an important issue. If we recollect one of the most cultural documents, the Bible, then its first sentence is, 'In the beginning there was the word', and a word is nothing less but the most important information agent. If we look at the issue of information in relation to economic activity we can immediately obtain a simple proof of the importance of this phenomenon. Management is always a decision-making process and a decision is nothing but the result of the transformation of information into instructions. Action will depend on the kind of information received and the result of its transformation. So we have here both information systems and the information itself.

At the time when what matters is the reform of our economy and the organization of an accurate and effective management system, information and its utilization becomes the central problem. Immediately there are some observations which if referred to too often would change my speech into the performance of a masochist. It appears that if we take as a yardstick the proportion of GNP spent on the development of the information systems, in Poland it amounts to 0.4%. In the USA it is 11 times greater, and this may be the reason behind the difference in the standard of living.

Furthermore looking at the structure of expenditure spent on information technology, for its transformation and utilization, this again appears strange. For example the equipment, and whatever modern means of information transformation of information is available, is not used in the areas where this utilization is most economically effective. However, I won't go into details because I would like to concentrate on the aspect of information utilization that is a creation of, what I call, the psychological structure of success.

There are two factors which may influence the future of our economy and our system. What I have in mind is information generated outside about Poland, our industry, our economy and the internal information about what we are like. The point is to transform the psyche of Poles so that they would want to want, as one poet once said, and so that they could believe in themselves and believe in the sense/meaningfulness of action, so that they were no longer a nation of masochists perceiving only their own inability to act. Modern information generators and systems will play an important role in building this internal infrastructure of success. An initiative arose supported by the Ministry, the Home Economic Chamber, the National Bank and the Foreign Trade Ministry to

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construct a database which would promote economic activity at home and at the same time inform about the situation abroad and the areas of possible activities. Very often one meets abroad various business people, potential investors in Poland, whose knowledge of Poland is nil. Sometimes these are ridiculously embarrassing situations.

The fact is that these people do not need, won't invest their time, in learning about Poland. If we will not come forward with appropriate information, then these people will never come to us.

The construction of such a system, promoting information about Poland outside is one of the priorities. That is why I value so much the initiative of the Business Foundation to build such a system. However, the creation of an internal information system amounts to the improvement of the psychological well-being of our citizens.

I have recently been to the Trade Fair in Poznan and seen the stands of our companies and subsequently I visited the factories which exhibited at the Fair and we do have more than we think. Prof. Kuderski has recently visited our electronic companies and told me that he was surprised at the high technological standard of our electronic industry and he was amazed that we can't utilize it properly. And once again generating internal information and demonstrating to people that it all depends on them only if they would want to want, and this is our duty if we want to enter Europe. Thank you very much.

The Chamber of Commerce in Poland and abroad

Andrzej Arendarski
President of the Polish Chamber of Commerce

All over the world Chambers of Commerce act as hosts of information systems and via these institutions information reaches business people, that is, a group who, apart maybe from the police, use this information most effectively.

As the research indicates, in recent years the information barrier has been affecting small and medium-sized companies in particular, independently of their line of business.

The owners or managers of those companies indicate that, in the majority of cases they learn about events, laws, rules and instructions with some delay and that the information which they receive is prepared in an inappropriate way – transformed, obsolete and in some cases, false.

Most of the information, as the results of the survey show, consists of press releases and official news. Very rarely does it happen that well-prepared information is supplied as a service and on a regular basis. This is the reason why an often disproportionate expenditure of energy and cost is required in order to decrease the information gap faced by small and medium-sized businesses.

The overriding characteristic of such a company (small and of medium size) as opposed to a big firm, is the fact that it can't afford to maintain its own specialized information service, making observations, preparing analysis and processing data. Being familiar with the experience of the West we know that everywhere this role is played by the Chambers of Commerce which organize the access to information for this type of company, usually constituting about 80% (of all businesses), and fulfil their requirements.

Chambers of Commerce have at their disposal a wide range of information. It is information regarding the basic rules and conditions in which the companies will act both at home and in foreign markets. They create possibilities to find a partner for co-operation; facilitate contacts for co-operation, import and export; and point out changes in legal regulations related to commercial, industrial and financial policy. The information is held on various databases (of course we are now fully computerized) and is available in the form of publications, brochures and expert publications.

The advantage of the information system provided by the Chambers of Commerce for small and medium-sized businesses is that the users, that is the representatives of small business, directly define the type of information they require, the degree of its conciseness and the form it will take.

The Chambers of Commerce network is very strong in Europe. The organizations work under the auspices of the Association of Chambers of Commerce of the EEC countries, EuroChamber. Their network is called EuroChamber-Net and is connected

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to the EEC countries internal networks. Consequently, there is no problem in finding appropriate information. Apart from this there are many databases, about which I will talk later.

For us, all this sounds like a beautiful fairytale. Nevertheless, we want to undertake actions which would make it possible for a Polish businessperson to access those databases and to utilize the information for the benefit of his or her company. We also try to carry out certain educational work so that it becomes evident to every business person that using such means as information, and paying for it since it is a commodity, increases the effectiveness of the firm.

Referring to the speech of Minister Zawislak who, as far as I know receives Chairs of only large companies, I must say that we, on an everyday basis deal with the representatives of smaller companies. We are in a very difficult position because we would like to help them to act on the Polish market, in the interests of our country, and we would like to provide information quickly. However, at present, taking into account the existing state of affairs we are unable to do it. Consequently, we have faced the necessity of creating a general system which will eventually comprise all Polish companies. The work on it is quite advanced and we have now started a trial implementation of individual segments of the system.

There is, of course, a financial barrier. We simply can't afford to create the whole system at once so that it could begin to function in a short time. We will have to do it in parts. Here again we face a problem. Our members, Chambers of Commerce from all over the country, have very good bilateral contacts with their equivalent Chambers of Commerce especially from the west European countries. Within the schemes of co-operation and assistance with those chambers they create their own databases. Having 70 members, Chambers of Commerce and other organizations, we face a task of preventing the creation of 70 incompatible systems and the Home Chamber of Commerce has to play a role in this. Otherwise, we will have to create interfaces and transfer information from one database to another. This is our role as an organizer and we emphasize it very much.

I would like to acknowledge the assistance we receive from the EEC countries. First of all the French Association of Chambers of Commerce and the France-Pologne Foundation help us with the know-how, that is, in the preparation of the concept. This has already been completed. Similarly, we co-operate with the Chambers from Holland , Germany and the UK. We can't underestimate this assistance because it is a matter of such importance and because in those countries it is so highly developed that we are following and will follow the best examples.

Finally, I would like to talk about the very principles on which this system is organized in Poland. As I have already mentioned we have 70 members among which there are Chambers of Commerce and commercial associations. There are altogether 400,000 companies associated by our members, so they constitute a considerable part of our economy. This process continues. New chambers are being established. At present we are in the process of establishing branch associations which will comprise large state enterprises.

In addition we have in Poland a network of 23 promotional centres formerly PHZ

(Polish Foreign Trade Chamber). On the strength of the Act of Parliament, the Home Chamber took over the Polish Foreign Trade Chamber. The structure which we took over was used to create a relatively modern promotional system promoting mostly Polish foreign trade but also Poland as a place for prospective investments. There are 23 offices all over Poland. Finally, the Polish Chamber has 7 agencies abroad in Western and Central Europe.

I also have pleasure in announcing that The Ministry for Overseas Economic Co-operation together with the Home Chamber formed a joint standpoint regarding creation of Polish Trade Centres. We started working on this last year with Minister Swiecicki and it is in progress. Polish Trade Centres will be Polish co-operative trade agencies which, in contrast to the state agencies dealing with the matters of state importance such as treaties, will be providing services to Polish and foreign business people with regards to supplying contacts and the distribution of information about our country. They will form a part of the system which we are creating.

I would like to inform you of the good co-operation we have with a number of institutions in creating this system. (These are) the Ministry of Overseas Economic Co-operation which I have already mentioned, the Ministry of Industry, and also the institution subordinate to the Ministry ie the Agency for Industrial Development, and the Business Foundation.

I believe that by integrating our efforts we can, in a relatively short time, create quite a reasonable system with the natural ability to develop and to become at one point a complete system.

I would also like, if you don't mind, to say a few words about the EuroInfo Centre. We are waiting to establish this institution in Poland because the degree of information about the Common Market and the EEC is very unsatisfactory. It is true that there are various sources of information. One of them exists in our Chamber. I think that we have the best library as far as the number of legal acts and economic information is concerned. A similar one is at the Institute for Economic Affairs and Prices.

However, the *point* is to create a single establishment in which everybody interested can obtain comprehensive information about various areas. A similar role is played in many countries by the EuroInfo Centres. Home Economic Chambers, together with the Business Foundation, will attempt to become the host of this agency in Poland and to use the network of members and promotional agencies. Thus, information will be produced in the quickest and most effective way to Polish business people and anybody else who wants to use it.

Finally, I would like to mention two other networks which should open their door to Polish business people. The first one is the European Business and Innovation Centres Network and the other is the European Venture Capital Association. The originators and the users of these networks are Chambers of Commerce of the EEC countries. We would also like to have access to those databanks as quickly as possible and make the information available for businesses.

Two weeks ago the Home Economic Chamber applied to the Euro Chambers so that when Poland becomes associated with the EEC we could also receive the status of an associate member and co-operate on a large scale, especially in the field of information.

Question time

A delegate
I have a brief question about the Polish Trade Centres. Do you have plans to set up such centres in the USA and if so, how will they be financed?

Andrzej Arendarski
It is a very good question. To begin with I would like to say that the economic chambers in Poland differ from their equivalents in the West in that they are poor. As you know, the system of subsidies does not exist and every business person has to pay their membership fee from their net profits, so it is evident that we are not able to lift such a burden. However, a promotional fund exists which is at the disposal of the Minister for Overseas Economic Co-operation and the fund can also be used to finance this type of enterprise. I would like to say beforehand that the Polish Trade Centres are to be commercial institutions which will aim at becoming self-sufficient in the not very distant future. They are intended to be non-profit making of course, but they should earn their keep out of the service they will be providing.

A delegate
Do you mean charges for the access to information or the membership fees from the companies interested in the Polish Trade Centres?

Andrzej Arendarski
Yes, there will certainly be charges. It is normal practice and, of course, you pay also for the access to the databases in the EEC.

The charges are very reasonable and they make it possible for the system to exist, to maintain it. No one wants to earn profit on it. However, there must exist funds to pay for its functioning.

A delegate
Have any specific USA cities already been selected as abodes of those trade centres?

Andrzej Arendarski
The decision has not yet been taken.

A delegate
Krzyszt of Zieba z ART-B. I have a question, please. As far as I understand there are two main aims ie. providing information for Polish businesses and creating an information system about Polish businesses. They are as if two sides of the same coin. That is why I have the following question – did the Home Chamber, creating information systems about Polish businesses, have to include some European instructions in order to establish the flow of information in the other direction, in order that the information about Polish firms was available to the European business person? I also

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wanted to ask for the details of this trial system now initiated and any resulting from these difficulties.

Andrzej Arendarski
Well, I just mentioned the co-operation with our colleagues from other chambers, mainly French and Dutch. This co-operation aims mainly at creating a system in Poland which would be compatible with the systems in those countries, so that we would not have to change everything in two or three years time. We have enough imagination to see this problem as dynamic and build the basis of this system. We are certain that this will be something not "made in Poland" but "made in Europe".

A delegate
What are the functions of the Polish Chamber of Commerce?

Andrzej Arendarski
Functions. Well, there are various functions. First of all, in Poland it is very difficult for one business person to meet another and to do so they use *The Warsaw Life* or the *Electoral Gazette* and they search in the advertisements. This one could have on one's desk or on the screen. This is one thing. The second thing is that those systems could be searched for different things; and you can make a very accurate search of your partners. Lastly, we as a Chamber annually prepare lists of Polish companies in different lines of business. We would like to widen this activity. A system of this kind is the base of such publications. This also refers to the service for our foreign guests. If during a conversation someone asks a question, in a few minutes I can bring a printout and say, 'You should go to Lodz, to such and such an address, to such and such a company.' At present it takes us well, a week maybe, to obtain such information because one has to telephone our office in Lodz, they search, and so on, and it is done in an old-fashioned way.

I think then that the aims are quite evident. As far as the difficulties are concerned it is as I have already said. The finance. We have very limited finances. As a result we have to work piece by piece and restrain our colleagues from other chambers from creating their own local systems which later on will by no means form a part of the all-Polish system. So the matters are complicated.

A delegate
Maybe I will ask a question. With regards to the last issue you said that our finances are poor, but maybe information is too cheap? Maybe the situation regarding the organization of the information would improve if the cost of information was credible. This is one (question). I would also like to ask Minister Kuklinski a question. You asked for a discussion about the improvement of our situation. It appears to me that it is also a question of language, the language of communication, which in the case of our country has been discontinued (in its use) as a result of well-known historical events. I mean, of course, five years of war and then those 40 years (of Soviet influence). Shouldn't we bring our attention to the revival of certain notions which, it seems to me,

has not been deformed so much in Western Europe. I would like to ask your opinion about it.

Minister Kuklinski
I would not be so pessimistic. Why not? Because we should remember that in the field of social sciences, that is, with regard to the basic language of economics, sociology and political science, the situation in Poland is not too bad. It is because our representatives of the social sciences from 1956 were no longer cut off from the achievements of the world of science. It can't be said that Polish economists were cut off. Of course, there are various Polish economists, various Polish sociologists and various Polish political scientists. There is for example a professor of economics at the Warsaw University who never crossed the western border, but all the time showed eastern orientation. There are such cases. In general, however, the Polish social science professions were not cut off, and here lies our advantage in comparison with, for example, Czechoslovakia, as Czechs were cut off from 1968 to 1988. In any case at the international conferences we do not feel any language barrier. We Poles speak boldly, we know the language both at the seminars in Poland, as well as at the seminars in the USA or in Western Europe. So I do not perceive this problem in the way that you do.

A delegate
There was another question about the price of information. I wish I could simply offer information free of charge to everybody. Why? In order to make people accustomed to it. The price, however, is always a barrier and our economy is not yet a market economy to the extent that it functions on the principle of widespread competition, and information and its acquisition is not an obvious advantage. It is not yet seen in that way. Consequently, in order to make people accustomed to using information, I would willingly made it available for free. Maybe if I was a Morgan then maybe I would do it on my own account! We will have to charge for it but it will be a very reasonable amount.

The Chairman
Minister Zawislak would like to add something.

Minister Zawislak
As we have touched upon the subject of the financial aspect of information I would like to make an observation. That is that we are determined to resolutely deal with the question of copyright protection with regard to computer programs. Poland is at the moment a country where many piratical practices take place and we became infamous because of it. Now we are determined to put an end to it and "return to civilisation".

A delegate
What ventures are undertaken in the Ministry in order to build the infrastructure for the transmission of information?

Minister Zawislak

In our department we perceive the issue of information on three levels. As I have already said, the first is information directed to outsiders. The second is information directed inside, that is, the information flowing in between the companies, and between the companies and our society, building a certain image of our economic potential. And lastly there is the information on the third level, that is computer integrated manufacturing, and it is at this level that the ministry wants to be very active, availing itself with a variety of assisting funds. But in this field we are at a very early stage. However, at present in the department headed by Minister Bialowolskiego, which is a section of small business promotion we are building a database which allows users to obtain an immediate answer for all the questions they are interested in. We are relatively advanced in this sphere.

A delegate

If I could only complete the Minister's statement. I am from the Centre for Scientific and Industrial Information attached to the Ministry. We work on databases, and amongst others a database of companies has been created. Polish companies apply to the ministry and suggest in what ventures they would like to participate with a foreign partner. The database includes a description of the venture, the type of the company and what is expected from the foreign partner. There is a plan for a shadow database, one which would include the information about the western partners who applied. Our centre works on a database of textile companies and we already have about 170 recorded. These are also companies which are awaiting a co-operation with foreign partners. Apart from this our next initiative has been created together with the company Video Offer Bank. This is a database of the companies which again would like to co-operate, supported by a short informative film. We have tried to combine the database with audiovisual information, which paints a picture of the company and its expectations. Lastly, through our centre there is access to world databases through the services of DIALOG, ORBIT SERB SERVICE, and to economic and financial data via PERGAMON.

A delegate

I would just like to say a few words about the circulation of databases. At present many databases holding information about Polish and foreign partners are being created, but the method of its distribution through networks and electronic access is not very realistic and will not be realistic for some few years due to the very poor condition of the Polish telecommunication system. That is why I would call for publication of those databases in the form of printouts, that is, to publish them in the form of books. The Business Foundation has just published a directory of Polish companies which, although not complete, is very useful and I would encourage this type of publication while the telephone network is very poor and cannot be used for this purpose.

A delegate

My name is Vladimir Kozakov from the Russian Republic. I am deputy Chairman of the International Council of Training. From my point of view Poland is the best bridge between Western Europe and Soviet Russia. What do you think about the possibility of connecting our database, with information about Russian industry using the Polish Republic to introduce our information to the European market?

The Chairman
May I now ask Mr Arendarski for a comment.

Andrzej Arendarski
Well, suggestions such as this can only be greeted with great recognition. I would like to emphasize what you have already said that this is the role of Poland, that it is situated between your country and Western Europe, somewhere in the middle. I think that it is our role, our chance, as you said to build a bridge, and not just in the sphere of economics. To say how we personally highly regard the importance of the relations with your country I will just say that Minister Zawislak is the chairman of the Association Poland–USSR. We are looking for all possible forms (of action) to make such a bridge out of Poland. With regards to any specific suggestions please contact me and we will talk about it.

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EUR-OP: information and publications in the context of opening onto Central Europe

Serge Brack
Office for Official Publications of the EC

It is obvious that explaining in depth the information policy of the European Community and the role that the Publications Office is playing in that context would normally require a much longer period of time that we can actually afford today. My aim will therefore be to try to give you the best possible general survey on those matters and to leave it to your possible later questions to come back and go further into details on particular topics. In order to ease your following this intervention I will just say a few words about the articulation of my speech.

A few words to start with about the EC Information Policy in general, and more especially in the context of the opening to Eastern Europe of the Publications Office which I represent today. Talking of the Publications Office, I would like to give you some basic facts about it, explaining the nature of information that our publications cover, say a few words about the vectors that we use for distributing this information, and a few words as well on the documentary tools that we can put at your disposal. Finally I'll explain how our distribution system works.

The EC Information Policy first of all. Ever since its creation the European Community has been facing the necessity to inform its own citizens in the first place, but also the citizens of neighbouring or partner countries on its functioning, its goals, its achievement, sometimes also on its failures. The expectations of the public in that respect, the needs for information as they were expressed, have been continuously changing as time went by and it was a major challenge for the European Community to try to adapt to this permanent evolution. Originally organized on a centralized basis, which means Brussels, Luxembourg and a network of press and information offices in the various member states the EC Information Policy has been progressively re-oriented and turned into a more decentralized one using mainly existing relays.

The key word here is subsidiarily. Subsidiarily means don't have a dog and bark yourself. In other words, don't do what other people can do better, more rapidly, and more efficiently. It took a long time for the Community to realize and understand that basic principle but I think we got the message and the new information policy is now completely organized on that basis. It means that we are more and more calling on existing networks, on existing channels which are all adapted to the countries where they are established and are therefore well-known by the public. To disseminate the information that we produce we are therefore considering ourselves in charge of supplying information to information suppliers which is quite different and no doubt more efficient than what we used to do before. Relays have been established in the course of the years, such as European Documentation Centres for the academic world, EuroInfo Centres for business life, industry and commercial companies, Consumer

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Centres, Agricultural Info Points and so on, and there are new networks being created every month.

The dramatic changes that took place in Eastern Europe recently almost brutally confronted the EC with the necessity to organize information and a new public that it was not used to addressing before and that evidently was less familiar with the community. The information policy that the EC has decided to develop in Eastern Europe will therefore be organized in two steps and focus on three major questions. What is the EC? How does it work? What does it do?

Certainly for the first step, this information will be factual, it will never be ideologically coloured. The techniques to be used will cover the traditional ways like press conferences, participation in meetings, online meetings and so on and so on. But a key element here in eastern Europe will be also the development of contacts with existing or forthcoming networks of relays covering all the social groups: unions; women's associations; consumer associations; churches; schools; universities and so on. In the first step those contacts will inevitably be passive, those relays will indeed have to absorb masses of information in order to catch up, but in the second step they will definitely be interactive and more specialized. That means that those relays will help us in supplying the information to the East European public, but also to supply us with information on the East European countries.

It is obvious that publications remain one of the main vectors of information and that a number of them will be published in Eastern European languages. The Publications Office was created in 1969 and is based in Luxembourg. It is the publisher and the distributor of all publications of all European institutions, and let me emphasize this, we are not working only for the Commission – we are working for all the institutions that are part of the European Communities systems, the Parliament, Council of Ministers, Court of Justice, Court of Auditors and also smaller organizations, more technical ones, like the Centre for Vocational Training in Berlin or the Foundation for the Improvement of the Living and Working Conditions in Dublin. As a consequence of this situation we may be considered the central provider of publications and consequently of information on and from the EC.

What kind of information do we offer? What kind of publications do we distribute? Well, a lot, probably far too many. In order to help you understand the structure of our publishing activity I would like to divide the publications that we supply into three main categories. First of all the legal texts. We do publish *The Official Journal*, two issues daily in nine languages and this is the normal vehicle for all legislation of the European Community. We do publish the Case Law of the Court of Justice, Parliamentary papers, all the documentation focusing on the Community legal order.

The second category is information on the EEC. In that category there is the light documentation, the information booklets that our Directorate General for Information is producing, and which are of course the very first documents to use when you start an approach to the European Community as a whole. I would also put in that category a number of publications that are in fact descriptive publications, giving explanations on the functioning of the EC and on its various policies. We also produce information from the EC: scientific and technical reports; economic studies; statistics; working tools, such as comparative tables between social securities systems and so on. In all, 85 periodicals per year, and more or less 700 new monographs a year, covering 20 main subject groups.

There are a number of databases as well, of which we distribute about 15 commercially. All those publications are normally produced in the nine official languages of the Community. I will not enter into too much detail on databases, since a colleague of mine will have the honour to do that during session four and is much more competent than I am to give you the technical details on those products.

Those are the three categories of publication that we distribute and that we offer, but how do we sell them, how do we offer them? Well, on a variety of vectors from the traditional paper to the audiovisual products. Paper publication remains the main one, the main way of producing and distributing information. As paper publications we understand the publications themselves, the books, but also more elementary items that we call documents, which are unsophisticated texts, produced in a rather cheap sort of way in a very limited print run and then reproduced on demand as orders arrive. To the paper category belongs also, though in a more particular way, what we call the document delivery system, which is expanding very rapidly nowadays. Document delivery means looking at, identifying, producing and supplying a piece of information, generally legal. We have systems for that kind of service, which I will describe later on. Next to paper there is of course the microfiche. A number of our publications exist in a microform version which is, of course, full of advantages in terms of storage. Electronic products have been developing very quickly in recent times and cover databases, magnetic tapes, diskettes, CD-ROMs and very recently we entered the business of audio-visual products, and video cassettes of various standards.

The mass of information we produce is enormous and it is very hard to access it. Documentary tools have been designed in order to help people approaching that material. As documentary tools I would like to mention catalogues of course, which consist of general catalogues, commercial catalogues and more specialized catalogues, this speciality being either a specialization by author eg. catalogues on the publications of Parliament, of the Commission, of the Statistics Office, or a thematic specialization, publications on agriculture, publications on industry and so on. A new development in the context of catalogues is the creation of the central database that we have recently undertaken and that will enable us to produce almost on demand catalogue extracts of a very specific nature.

I couldn't talk about documentary tools without mentioning a system that we are very proud of, ABEL. ABEL is a system that ensures the document delivery operations. It's basically a system consisting of three parts – a databank for research purposes, an optical archive for the storage of information and production of high quality copies, and a battery of telefax for sending the information. That system is actually limited for the time being to the *Official Journal*, and to the legal part of the *Official Journal*. It is therefore not exhaustive in terms of publications, but it is a very efficient system, very fast and reliable.

I have explained what kind of information and what kind of publications we are offering and how they can be identified and through what documentary tools they can be identified. A very important question remains of course. How can you obtain them? Well, the Publications Office has always been conscious of the fact that using a network of sales agents was full of advantages and we have been using sales agents from the very beginning. All sales agents are in the member countries, they speak the language of the public, they can give explanations in that language, they can give demonstrations or send copies of information to the people who really need them. They can inform us about the needs of their own public, they can accept payment in local currency, which is not only a problem in Eastern Europe, it is a problem in many places. We therefore have created a sales agents network which has been expanded and covers most of Europe and the industrial non-European countries, such as the United States and Canada, and Australia. We are proud to have been able to extend our sales network to the new democracies of Eastern Europe, almost as fast as the Commission and the Council of Ministers established their official links with these countries. In the case of Poland we have appointed the Business Foundation as our agent and I remain convinced that this will be for our mutual benefit as well as for the benefit of the Polish citizen. Through our sales agents we also try to encourage book sellers to take part in the commercialization of our products. It is not always easy but we have not lost all hope to create in the whole of the Europe a comprehensive network of booksellers.

As to document delivery, the situation can be different from country to country – in some places all sales agents have to act as document delivery agents as well. In some countries we have been forced to use the services of specialized organizations. As to electronic products, and mainly databases, we have a policy of dissemination through hosts, gateways, licences, agents or even directly. I will not talk too much about that, for my colleague Mr Mortier will give you more information on this subject during session four.

The European Bank of Reconstruction and Development as a factor of European Integration

Grzegorz Wojtowicz
President of the Polish National Bank

Good morning ladies and gentlemen. I have come to the conclusion that all great events result in other great events. However, the rule is that first there will be great political events and then either more political events or economic ones. And so in 1944 at the end of the Second World War a few clever people started to think about establishing an international monetary order. In this way in 1944 the idea was outlined to create the International Monetary Fund and the International Bank for Reconstruction and Development, which is now called the World Bank.

When 45 years later the period of the Cold War ended, which was also another great event, yet a further great event resulted – an attempt to create the European Bank for Reconstruction and Development, the very first common financial institution of the European countries.

The idea was put forward by the French President Francois Mitterand in Strasburg at the end of October 1989. As a result of an enthusiastic atmosphere which accompanied this idea the treaty was signed only 7 months later. The treaty was signed by 40 countries including European, 8 non-European and also 2 organizations ie. the EEC and the European Investment Bank. We had to wait 10 months longer for the official inauguration of the Bank. This took place in mid April 1991 and as the British press and others stated, it was a great celebration, but there was also a big question mark over the future of this institution.

The bank is located in London and is not headed by a bank director. Those questions marks, which arose earlier and on the day of the celebration, are now being changed into some other marks. They are no longer question marks but dots which are supposed to be followed by the statements resulting from the negotiations of the bank representatives with particular countries.

What kind of institution is the European Bank for Reconstruction and Development?

It is an institution with an enormous declared capital of 10 thousand million ECU, that is more than 13 thousand million dollars. It does not mean that this capital is recorded and banked. The capital held on deposit will amount to 3 thousand million dollars. The first period of payments has just ended. The countries pay 6% of their capital each for 5 years. This should be sufficient for investments financed by the Bank. The safeguards of the member countries and organizations constitute the rest. So if something happens, if the money runs short, then they (the members) will deposit more.

The discussion about how influential each of the shareholders will be was relatively short. It turned out that the USA, with 10%, is the largest shareholder. It transpired that

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the EEC countries want to have the majority and indeed, they have 51% of the shares. It also turned out that considering their potential, the eastern European countries should have a relatively large proportion of shares at their disposal, ie 5%. The USSR has 6%. This last subject was thoroughly discussed because it had to be considered how in a country so large and having problems not smaller than its size, how the investments would depend on this capital.

But let us leave the problems of the USSR behind and let us talk about Poland. Poland has a share of exactly 1.28%. Today we are banking the first part of our share. It is Poland that is considered as potentially one of the greatest beneficiaries of the Bank. This is because of the following philosophy represented by the Bank: democracy is to politics what a market is to economy. Poland is the quickest to advance and so it should be quickest to avail itself of the Bank's activity and do it to the greatest extent. But this is a general motto. We will see what happens.

At the moment the situation is as follows. Poland would like to be included in some of the Bank activities, particularly its investments. What is the range of investments? First of all the Bank, like other financial institutions of this type may grant credits to private, commercialized and privatized companies. It may also take part in the financing of the credits granted by someone else. Further, the Bank can buy shares in the private, commercialized and privatized companies. It can provide safeguards for all the types of companies I have mentioned before. The Bank can also create various types of investment funds and provide technical assistance. I have not given specific examples. I just wanted to conclude that the formula is very broad.

The discussion about this formula still goes on. Ought the Bank to accept certain procedures of the international practice such as is the practice of the World Bank, or ought it to be more flexible and be an organization taking more risk, due to the type of the investments it implements? The discussion for the time being remains theoretical. I believe it will be resolved when the specific projects and results of those projects will begin to be financed. Then it will be seen whether it was a small or a large risk – risk for a country, a company or a currency. In order not to go into long considerations let us discuss the relations between Poland and the Bank. This works on the setting up of a mutual fund, and mutual investments are relatively advanced. This would act as an active investor accelerating the process of privatization. It is highly probable that before summer the discussions will be advanced to the extent that in the autumn we will be able to create such a fund.

Another initiative, which many of our colleagues are very keen on, but which I must admit has not as yet taken shape, is an attempt at establishing a financial institution which would be responsible for the financing of the Polish telecommunications system. I believe that for two or more years there has not been a single conference in Poland at which this problem would not arise. I would like to clarify what we mean in this case. The point is to establish a financial institution which would resolve the problem of financing the whole telecommunication system. We do not have in mind a loan. It is a very interesting idea and may bring results but as it is new it is difficult to say when it will be concluded.

Another extremely important issue which is already in progress is that of restructuring the social insurance system. There is no doubt that in this field we are far from the position we would like soon to achieve and this is the reason behind this initiative.

The fourth is the infamous problem of environmental protection. We believe that talks that are now in progress with the European Bank which will focus on the issue of environmental protection mainly in the Baltic Sea and Northern Silesia regions. However, the problem is to combine the Polish initiatives and the efforts of the European bank with the existing initiatives put forward by the Scandinavian countries.

The fifth area is that of regional development. It is an extremely difficult one but it is good that we have started to talk about it.

I would like to point out the fact that apart from Poland, the Bank will carry out its work in other countries of the region, that is in Bulgaria, Czechoslovakia, Yugoslavia, Romania, Hungary and the USSR. Consequently, the Bank's 42 shareholders will work for the welfare of the remaining seven shareholders. However, all this, as I have mentioned, is still in the preliminary stages. Nevertheless, confidential talks are taking place between the European Bank and several Polish companies.

An idea was introduced to assist those companies by providing a sum of several million dollars. The companies do not necessarily have to be privatized or restructured, although eventually restructuring will have to take place. It was a general call for financial support for the existing companies.

These confidential talks are relatively advanced. We do not know the names (of the companies). We act in such a way so as not to infringe on the freedom to make contacts. We do not interfere. What we have in mind is the creation of "brainstorm". Perhaps it is not the most appropriate expression, but what I have in mind, is a freedom to identify the most essential problems. I believe that we will soon be able to talk about those issues in a concrete way.

Finally, to speed up the financial activity of the Bank, we suggest that the European Bank co-finances credits which Poland receives from other sources, namely mostly from the World Bank. I hope that the World Bank will soon co-finance a project called 'The development of communal heating'. The participation of the European Bank is also highly probable and will equal $50 million.

The Bank functions on the basis of missions of executive managers representing particular countries. Our executive manager, Prof Winiecki, represents Poland and Bulgaria. Together with his seven colleagues he has recently visited Poland. From the conversation with them, I infer, that the Bank started to eliminate question marks, which I mentioned a few minutes ago.

We want to open a European Bank office in Warsaw. In fact, this is the Bank's initiative. I believe that in this way we will be able to promote it to a lesser degree and give less speeches and instead, there will be more contacts with the office and these should give the expected results. I think that by planning enterprises and assisting in the process of transformation of our economies into the market economies, the Bank may bring about a real integration of the beneficiary countries, among others Poland, with the rest of Europe. Thank you very much.

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Question time

A delegate
I am interested in one problem. As far as I know, at present the EEC is working on the new classification of means of production. Apparently, the work is almost completed and the system is to be implemented this or next year. It is a very important issue with regard to access to business information. Is it possible to obtain more information about this system? And are the information agencies such as EuroOp interested in constructing in Poland a proper system of classification of means of production, which would facilitate the exchange of information in the shortest possible time?

Serge Brack
Excuse me. What you are referring to here is the new nomenclature for industrial products which is currently being developed by the European Communities. I must say, unfortunately this is not exactly my province, I'm not an expert on such matters. I know indeed that the European Commission has been working now for more than two years on the revision of the existing industrial nomenclatures and commercial nomenclatures, and wants to produce something that will be a combination of existing nomenclatures, purely European and other international, basically United Nations products.

As to your question about whether the EUROP might be interested in including, if I understood you, some of the information originated in Poland. No doubt the Commission would be interested in having information of this nature. It should not be the OP, the publications office, however, but rather the Statistics Office which is in charge and the Director General for Industrial Affairs who is in charge of this question that would be interested. I'm sorry that I can't give you more detailed and more appropriate information on that matter, but it's not really my business. Whenever the common nomenclature appears it will become my duty to make sure that it becomes accessible to the public. But as long as it is being prepared it remains the responsibility of the Author Department. What we can certainly do is to organize, either through the delegation in Warsaw or through our own channel, the Business Foundation publications office, the necessary circulation of information on this proposition and see what the Author Department will decide on. I'm sorry again that I can't be more precise.

Chairman
Thank you very much. Mr Chojna would you like to comment on this?

Bogdan Chojna
Your question referred to the classification of means of production. I am not sure if you had in mind means of production or the classification of products, because the latter classification also exists and is called the Central Product Classification – CPC. The United Nations was working on it in the 80s and the EEC is about to ratify it as a valid parallel to classification or nomenclatures of the turnover of goods. It classified goods according to their "transferability". If anybody is interested in this you can obtain

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information in our office, in the Business Foundation. The information has come partly from European publications and is available on the floppy discs which we receive via UN channels.

This information is at your disposal and we are at your service to discuss the subject of nomenclatures because we have in our company a few outstanding specialists in the field of classification and nomenclatures. Everybody is invited to the Business Foundation at 38 Krucza Street. Now, referring to the speech of Mr Wojtowicz on the European Bank for Reconstruction and Development and also to the speech of Minister Zawislak on the initiative of establishing information-publicity enterprises, promoting Poland as a country and also Polish businesses. This initiative, because it will probably take the shape of a "joint venture", will be one of the first customers of this bank. As soon as the credit channels are open we intend to apply for a considerable credit for similar purposes. Thank you.

A delegate
You were speaking about the initiative of a ministry, a bank, a Chamber of Commerce or a company. I would like to know if the Ministry for National Education joins in this integration of information and if so, perhaps someone could tell me how this progresses, especially in agriculture. It needn't be now, in this room, but perhaps later. Is there anybody who could inform me about this?

Chairman
In the second session, we will have speeches from people interested in the scientific and academic computer networks. People from the University Computer Centre, and from IBM and DEC will talk on this subject and this falls within the cognizance of the Ministry for National Education.

A delegate
I would like to ask Mr Wojtowicz if he could explicate the subject of credits for Poland for communal heating. That is, when can we expect concrete results, how quickly those means will be available and if a policy exists, on what aims will it be spent?

Grzegorz Wojtowicz
Poland has so far received 11 credits from the World Bank. Ten have already been started and this eleventh concerning communal heating comes from the last few days. We have been negotiating this credit for many months. It refers to financing this sector in several urban centres. You may obtain full information about the credit, which is still "hot", from the Overseas Credit Department of the National Bank of Poland. All the details regarding this credit may be made available to you. It is a $380 million credit, that is the largest so far granted to Poland by the World Bank.

A delegate
Jan Czerwinski from Video Bank Offer SA. I have the following question. It is very valuable that information flows from Europe to Poland and very important for us but

it would be valuable if the flow of information existed from Poland to Europe. To be more specific, is there a possibility of system entrance to ECOP publications coming from Poland?

Serge Brack
Yes, thank you for the question. Indeed it is desirable that the flow of information is not limited to EEC–Poland, but be extended to the other way round, Poland–EEC. The Publications Office as such is not allowed to publish or distribute publications which would not be related to its normal activities.

However, I think I can give you a much more positive reply in two ways. Even if we are not able, as the official publisher of the European Communities, to distribute in the member states publications that have not been officially produced by and for the Communities, we can certainly play go-between between publishers here in Poland and distributors in the rest of the industrialized countries. We can certainly ask our sales agents, which are very often private companies, to ensure the distribution of interesting Polish publications in their own countries. This is something which we would certainly be prepared to do.

On the other hand we have developed a policy of co-publishing. What does co-publishing mean? It means that we contribute, together with one or several private publishers, to the production of a book. That policy has been used mainly for producing our publications, of course, at our initiative. But it can be used the other way round. And it could be extended to the countries and languages which are beyond the nine official languages that we use already. Which means that if a Polish publisher wanted to produce a publication related to the relationship Poland–EEC, the book would have to deal with some aspect of the EEC activities, and co-publication would be envisagable. I can't say that it would be absolutely sure every time but we would certainly be prepared to consider that possibility. If a Polish publisher were to produce a book on the economic relationship and the EEC we might be interested co-publishing. We would certainly be prepared to study the question. Of course, we could not produce or co-publish publications on the Polish export policy, except if that book is on a Polish export policy to the EEC. The book must be connected somehow with the European Community. So, to summarize one possibility of co-operation to improve the flow of information from Poland to the west is the role of a go-between to introduce you to a number of publishers and distributors in western Europe and northern America, and the other way of doing it is the policy of co-publishing, that is, partnership. Under certain conditions, of course.

A delegate
I wanted to put forward a question to Mr Serge Brack. You said that the EEC publishes documents regarding associations, addressed to associations. I wanted to ask if the EEC deals with publications regarding macro regions or small local communities, for example, providing information about the examples of development in such environments.

Serge Brack
Yes, we do. We have publications on the regional development and we have publications on local communities, local initiatives. We have several titles, I don't know them by heart, as you can imagine, but we could certainly give you more information on that, either with catalogues or in a private conversation that I am prepared to have with you whenever you like. We have a stand here at the exhibition. A number of our publications are there on display. You can have a look and you can also obtain additional information. But as to the principle, I can confirm that we have indeed produced a certain number of publications on that subject.

A delegate
I would like to direct a question to the President of the National Bank. I am from CAB International in the United Kingdom, an intergovernmental organization, which provides agricultural information services worldwide. I am in the process of discussions with the National Agriculture Information Centres in all the eastern European countries. Their intention, which they have decided upon at a meeting in Budapest is to establish an agricultural information network for the region. It needs financial assistance to get it off the ground. They are talking to us about actually providing services and support. The possibility of the European Bank for Reconstruction and Development providing technical assistance to the establishment of an agriculture information network for Eastern Europe has been mentioned. Does the speaker think that might be a possibility?

Mr Grzegorz Wojtowicz
I think it's really quite an interesting idea and I should like to say that we have one agricultural bank. I will consult this idea with them and then I think we'll present together to the European Bank.

Chairman
Thank you very much. I think that it is time to close the morning session and I would like to thank the speakers and you, ladies and gentlemen, very much indeed for listening to the speeches and participating in the discussion. And last but not least, I would like to thank my "brother" in the booth, that is the interpreter who was very bravely interpreting our proceedings. I would like to say once again that I am the representative of the Polish Association of Translators and Interpreters and we participate in this conference by virtue of our profession. We are agents of information. We are an old invention, but even in the most advanced information systems, the human factor still remains the most important.

We will now proceed to open the exhibition and I would like to ask Mr Roger Bowes to perform this task.

Roger Bowes
Thank you Chairman. Please don't panic I'm not going to give you another speech. As it says in the conference brochure, just five words I promise you, five lines. It says "as Poland moves towards privatization and a market economy, awareness of the need to

access precise and current information increases. Being aware of such needs is a far cry from utilizing the real benefits available via the latest information technology."

Well, we have that next door. Not only do we have a lot of sponsors here but we have a lot of companies who have made a commitment in time and money to come here to present their wares and discuss the opportunities with you. I'm sure you would like to support them by giving them your time to have a look at what they have on offer. As a courtesy to them I just want to mention the twenty five companies here: Architektura, Ark-group, Aslib, The British Council who also invested money in sponsoring the conference, The Business Foundation, of course, Centrum Informatyki Nauk i Przem, Centrum Informatyczne Uniwersytetu Warszawskiego, Compact, Dialog WIP, Digital, Dun & Bradstreet, Eur-op, Ewmark Ltd, Karen International, Mercury Ltd, Miko-Electron, OECD, Promoter, Roto Smeets, Stowarzyszenie Tlumaczy Polskich, Stratus Zaklad Informatyczny, TESA, TilPol, Uni-card and Visitronics. Twenty five companies who've invested their time and money to come here. Please do them the courtesy of going next door.

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Library co-operation on a European scale

Dr. Bram B. Oort
Erasmus University, Rotterdam

Abstract

There is always a limit to the services a library is able to supply. One of the ways to improve the service provision is co-operation with other libraries. An interlibrary loan service is a well-known system of library co-operation. Visits to other libraries and discussions with colleagues can be useful, but the most far-reaching form of library co-operation is to co-operate in a joint library project.

The European Business School Librarians' Group – founded in 1970 – started with an exchange of information between its participants. Very soon joint library projects were undertaken of which SCIMP: European Index of Management Periodicals is still ongoing. The members of this group were very enthusiastic in the beginning and emphasized that it was a working group. After some time a change in approach by most participants could be observed. Group performance just went on with an emphasis on library visits at the annual meetings of the Group rather than on discussions on subjects of interest. Recently new projects have been proposed and many older members have been replaced by new ones, bringing new life to the group. If individuals will be prepared to invest time and perhaps money, they might benefit on behalf of the service provision of their own libraries.

Introduction

Libraries are not strange elements in organizations nowadays; they are well known and the benefits of the services they supply are more or less recognized. Consequently the establishment of a library is seriously considered with the start of both profit and nonprofit organizations and this is not just a matter of status. It is also obvious to the management of organizations that once it is decided to install a library, it needs a budget in order to buy books, journals and other materials for the provision of documentary information to members of the organization. It also needs space to store these materials, while library staff are needed to make all documents available and provide the required information service.

Very often there is a discrepancy in thinking between the management of the organization on one side and the librarian on the other about what budget the library needs. Even if they do agree about it, however, there is a limit to the amount of money the library will be able to spend. Consequently this indicates a limit to the services the library supplies. One of the ways to improve the service provision is co-operation with other libraries.

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Library co-operation

No library can be self-sufficient and an obvious solution to help somebody with a book that is not in the holdings of your own library is to borrow it from a nearby library if possible. An interlibrary loan service is a very practical way of interlibrary co-operation. Nowadays it is part of the normal service provision of libraries. In the Netherlands there is a central, nationwide catalogue including the holdings of hundreds of larger and smaller libraries. It can easily be consulted online by its participants and is permanently used for an effective and efficient interlibrary loan service.

Library co-operation, however, can include much more than an interlibrary loan service. It may include an exchange of ideas, information and services. It can also lead to a better understanding of the performance of other libraries, while a tremendous amount of information can be gathered together from libraries covering the same subject in different countries.

From the moment you are qualified as an information professional, you should realize that you have to be kept informed about developments in the profession. An easy way of informing yourself is by reading professional literature. Many librarians, however, do not often read literature on library and information science, which is regrettable.

You can also attend meetings to listen to lectures on recent developments and talk with colleagues. Refresher courses will update you more thoroughly.

You can visit another library in order to find out what services other libraries supply and from which you might benefit. A special subject encyclopaedia in a nearby library for instance could possibly be used by your readers. If your readers do not often need it, you could advise them to consult this other library and use the money saved to buy another publication for your own collection.

By visiting another library you could also try to find out if there is a system that could be adopted for use in your own situation. Since libraries are not normally competitive to one another, you can often build on the experiences of your colleagues.

The value to these visits must not be overestimated however. Even if visits can be useful to broaden your horizon, you will not always find something that can easily be adapted for use in your own situation.

You must be able to discuss matters of mutual interest with colleagues, particularly practical things. From these discussions you will profit and learn that two and two can make five. You can build on the ideas of another person.

A good example of local discussions is the idea of a lunch time discussion group. One of these was launched at a meeting of the Association of International Libraries, in the autumn of 1990 in Geneva. This of course is only possible with libraries located near to each other.

A main advantage of discussions with colleagues is that you get to know one another. It is very important to be able to call somebody you know (and who knows you!) if you need help.

A practical form of library co-operation is the direct provision of services to other libraries, like the interlibrary loan service.

The most far-reaching form of library co-operation is to become involved in a joint library project, to provide a service that you cannot provide on your own. With this type of co-operation the following must be considered:

1) What will be the consequences of this liaison:
   - can you guarantee to fulfil your part of the commitment?
   - can you rely on your partners?
2) What circumstances will give rise to the desire to co-operate:
   - is it to improve your service provision?
   - is there an economic necessity?
3) What are the relations between the libraries wishing to join forces:
   - do they have a common purpose?
   - are they similar by subject?

Too much careful weighing of all the factors may be the end of the venture. Success or failure of a joint project is likely to be due very largely to the continued enthusiasm of its originators. It also has to be borne in mind that co-operation poses major problems where the management of the project is concerned, not least because, as the term co-operation implies, there is no overall management control.

An example of this is SCIMP: European Index of Management Periodicals, to which I shall return later.

The European Business School Librarians Group

In 1970 the European Business School Librarians' Group was founded with a meeting in Fontainebleau where 13 librarians from 10 libraries out of 6 countries met and decided to set up a co-operative. What they actually did at that first meeting can be described as an exchange of information. At the second meeting the first lecture was given, followed by ample discussion, and a visit to a library (the Library of the International Labour Organization in Geneva) was paid.

The first joint project was started at the third meeting, the production of a list of core periodicals in business studies. Partly as a result of this list, separate core collections including the most important books and journals on the different aspects of management have been developed by some business school libraries in different countries. The core collections remained separated from the main collections for some years. By the end of the seventies core collections were no longer recognized as separate entities. The final version of the list of core periodicals has been used as the first allocation list of periodicals for co-operative indexing in the SCIMP project a few years later. The idea of a Union List of Periodicals in European Business Schools came up in 1972 and the first edition was produced by Manchester Business School Library in 1973. It was not used as a tool for an interlibrary loan service, but rather to assist with the selection of periodicals for acquisitions. Many European business school libraries passed through a period of rapid growth at this time and the Union List proved very useful to individual libraries when considering additional journals to subscribe to. The last list was produced in 1979, including the periodical holdings of 24 libraries from West-European business schools. It was not until the late eighties that the idea of a union list of periodicals was raised again, now combined with an interlibrary loan service. On a small scale this may work, but it is debatable if this will grow to a European service, since there is no need. Large computer systems provide the information needed for a quick and efficient interlibrary loan service.

SCIMP: European Index of Management Periodicals was set up as a co-operative interlibrary indexing service by the exchange of catalogue cards. In 1978 input to a database at Helsinki School of Economics was realized, so the output was online as well as on paper. SCIMP was sold to non-participants, but both the number of online users, and the number of subscribers to the printed version remained rather small. A disadvantage of the printed version is that five-year and ten-year cumulations have never been produced. As for the online version there are three reasons for limited usage:

1) SCIMP never became a real European index since a lot of the journals indexed were American, making it competitive to ABI/Inform.
2) SCIMP is often overlooked by online users as it cannot be consulted through one of the main database hosts like Dialog or Data-Star.
3) Entering into the system often turned out to be difficult or even impossible.

There certainly is a need for an online index of European periodical articles on management, but first it has to be truly European, which means that even the main American management journals like *Harvard Business Review* must be deleted from the list, and in addition it must be made available through at least one of the main database hosts. The input of all new entries into the local databases of the participants as proposed in the spring of 1991 would bring back the original benefit to the participants and could motivate people to quickly index all journals allocated as soon as they receive them.

Throughout the years discussions on many library topics took place at meetings of the Group. Different projects were undertaken, of which the updating of the bibliographical part of a directory of the International Labour Organization in 1980 is worth mentioning, because it shows another kind of library co-operation. Visits were paid to all kinds of libraries in all parts of Europe, since the annual Group meeting is organized by different members of the Group in rotation.

Co-operation within a group

Whenever a group of people decides to set up a co-operative, the participants show enthusiasm and are prepared to invest some time in it if it is felt that establishing the group can be useful. In the case of a librarians' group, benefits to the individual libraries will be considered by the participants. In the beginning the members of the group will try to show results in order to prove to the management of their respective organizations that the time and money spent have been a good investment. After some time the meetings of the group may become accepted as part of the librarian's job and most members will not have difficulty in getting permission to attend these meetings. Reports of the meetings are likely to be produced and distributed among all members of the group. Reporting from this kind of meeting is important, and reports must contain texts of contributions and describe the progress of projects. These reports can be shown to the management of the organization. In addition to this, more personal impressions of the meeting attended could be put on paper with some interesting information to satisfy the management.

When the group has been in existence for some time, some participants will not be satisfied without something new on the agenda from time to time. They will feel that fresh ideas are needed and something new must be started if the group is to survive. It depends on the number of *active* participants whether this will be successful or not.

Individuals can retire or find new jobs and consequently new faces turn up within the group. Sometimes they have new ideas, sometimes they just try to reinvent the wheel. If the idea that something new must be started is shared by a fair number of participants in a meeting, this can give new life to the group.

Most of the time a group will start in an informal way. The aim is to do something together and to see results from the co-operation, not to make a perfect organization. Bureaucracy may kill kinship and after some time there may be a real danger that the group will become too bureaucratic, which eventually may lead to the end of the co-operation. At the start members will think in terms of what they can do for the group, since they will feel that they will benefit from being a member. After some time it may be the other way around, with members thinking about what the group can do for them. This is really dangerous for the continuation of the cooperation, because nothing will happen if all members think this way. Benefits are a result, but not something to start from. This is dangerous, for if the group is to continue harmoniously members must give as well as take. Benefits to individuals are important, but must not take priority.

In the first years after its establishment, the members of the European Business School Librarians' Group were astonished and delighted that it had turned out to be possible to form such a group from different countries. It was something the librarians could show to the managers of their schools since it was a new phenomenon. An emphasis was put on getting members from as many Western European countries as possible with the result that the number of countries represented grew from six to twelve (or thirteen if Scotland is recognized as a separate country).

From the beginning, the members of the Group wanted to co-operate by undertaking practical projects apart from informing each other about what was going on in their respective libraries. The fact that it was a working group with a minimum of paperwork was emphasized and every project undertaken was something to be proud of. The reports of the annual meetings grew every year and included all papers presented in order that members not able to attend could benefit as well. The co-operation was made visible! In addition to this it could be shown that libraries could work together even if their parent organizations were sometimes competitive to one another.

When the Group had been in existence for over a decade, a change in approach by most individual participants could be observed. The SCIMP project has become a main thing which was ongoing and needed a lot of discussion every year. Yet it hardly changed, it just went on and kept seventeen or so libraries busy with indexing. The annual meetings had begun to last several days and more emphasis was put on visits to other libraries than before. Sometimes one could get the feeling that some members considered the meetings of the Group only as a nice time abroad with colleagues you meet every year. New projects were not undertaken, even if the need for this was felt. Proposals for projects were made and either rejected or not carried out. More and more time was devoted to discuss the membership of the Group. The programmes of meetings were in the hands of the hosts. In the seventies the host used to consult other members beforehand for the programme of a meeting; during the eighties the hosts increasingly decided on the programmes all by themselves. Consequently there was not always a balance between time devoted to discussions and time for making excursions. As a result of this some members felt uneasy, and called for a more formal group structure. With the retirement of some of the older members of the Group in the late eighties and the coming of many new members, the character of the Group changed.

The future

Now at the beginning of the nineties the Group finds itself much more formalized. The informality of the past has gone, a statute has been produced and an official president has been chosen. The reports of the annual meetings have been reduced to reports of the business meetings only, including discussions on membership and rules rather than on topics of interest from a professional point of view.

Yet new projects have recently been proposed and some of them might be undertaken. The desire to co-operate is still there with many members and if this desire can be put into action, the benefits of such an action can be made visible again.

In the early years the aims of the Group were formulated as follows:

- exchange of information and ideas,
- discussion of topics of mutual interest,
- the development of joint projects,
- providing individual help to each other when required.

If the Group is to survive in the next decade, it should concentrate on lectures with discussions and useful joint projects. It should return to the original working group where co-operation is demonstrated by activities on behalf of the Group. The strength of this Group lies in its European character which includes an enormous potential for information exchange. If this can be used for the benefit of all libraries involved, the co-operation will remain and the general aim of the Group will be achieved.

Individual librarians should realize that you first have to invest in the Group by spending time and perhaps also money in some cases, before you can benefit on behalf of your own library.

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The treaty on association between Poland and the EC

Jaroslaw Mulewicz
Director of the Economic Department for the Foreign Office

It is a great honour and a pleasure for me to address you and give you a short summary of what's going on in our negotiations with the Communities. I have good news because we are approaching the final stage of negotiation which will be at the very beginning of July (1991), and there is a good chance that we will reach an agreement on an association between Poland and the European Communities.

We came up with the idea of association just two years ago, but there was not a proper economic and political situation through which to implement this goal. We are basing our concept of association with the EC on certain principles. The first of these was to be able to give a clear vision of the Polish society as part of an integrated Europe. Another objective was the perspective of future economics systems in Poland for foreign investors, something which is very essential for attracting direct foreign investments to Poland. Our idea was also to establish a certain external control over Polish economic transformation, thus limiting room for manoeuvre for this and future governments in respect of economic changes for Poland. All those goals were based on our initiative and the Polish government presented a memo on future association with the Communities in July last year. Based on this memo and the corresponding offer from the EC we started negotiations on 22 December 1990.

Since then, we have passed through five rounds of negotiations. It has been very tough. Many problems have been dealt with in great detail and as regards our future agreement we have three quarters of it in hand, already drafted. In the main elements of this agreement, except for the preamble – and I am mentioning the preamble because in it we have a provision on future Polish membership in the Communities — we have a part on political dialogue that, for instance, foresees regular political contacts among political leaders of Poland and the EC, including the contacts and regular dialogue at the level of presidents, prime ministers, ministers of foreign affairs plus ministers of economy. We also have provisions for setting an institutional framework for co-operation, creation of association councils, creation of an association committee, creation of a social and economic committee and some other bodies. As regards other parts of the agreement we have already drafted a part on financial co-operation and flow of financial resources – freedom of flow of capital to Poland. That is essential for future investors and people who would like to invest in this region of Europe.

We recently agreed on harmonization of legislation, just a week ago in Brussels, which is also an essential part of the future of the treaty that gives Poland and the Communities a vision of future adaption of Polish legislation to the EEC requirements. We started the process last year by passing a law in the Polish Economic Committee of the Council of Ministers which stated that every new piece of Polish legislation must

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be co-ordinated, verified and adjusted to European legislation. Of course it's the beginning of a process, but I think it's very promising that all new Polish legislation to about 8,000 legislative items will conform to Community acts and norms.

We also passed and drafted all parts on economic co-operation, which is essential because we have 20 fields for future co-operation, including industry, communication, agriculture, science and technology, and many other areas. With regard to co-operation in telecommunications and information, our aim is to improve the flow of information, (firstly for small and medium-sized enterprises in Poland) and promotion of trans-border co-operation through, for instance, the participation of Poland in the BC-Network of the Community to make it easier for Polish and foreign companies to establish direct contact between themselves. We would also like to establish, and we have promised the Community to do so as soon as possible, Euro Info Centres in Poland. To broadly understand the exchange of information in the first phase of association, priority will be given first of all to the programmes providing Poland with general information about communities for a wide spectrum of receivers, and information of a technical nature for concrete consumers. In this case we should establish (and we *are* negotiating it) direct links between computer-based information in the European Communities and in Poland.

We are also planning co-operation in the audio-visual sector through Polish participation in Community programmes, in the frame of media programmes for 1991/95 harmonization of audiovisual policy, technical norms and promotion of European technologies in the audiovisual sector.

As I mentioned there are about 20 sectors of future co-operation, reflecting Polish economic and social priorities. We also decided to go ahead with a very close co-operation in interpretation and in training of interpreters, both in Poland and in the Communities. We would like to achieve fluent Polish integration with the European Communities. In the agreement we also have a considerable chapter dealing with cultural co-operation and we should reach mutual integration in the future.

Now let me mention difficult sectors, because at the beginning I mentioned the easier ones from the point of view of negotiations. The most difficult sectors, except the preamble, were establishment of a free trade area, and financial co-operation, by which I mean the assistance of the Communities to Poland, and free movement of persons and of services. Those issues were the subject of a recent round of negotiations last week, and we agreed on the free movement of persons. There is a chapter drafted now on this waiting for approval by the member countries of the Communities and the Commission itself, but the prospects for approving this part of the agreement are good, so one of the very difficult issues of the agreement will be drafted.

Regarding the financial assistance for Poland from the Communities, services were discussed for a very long time and I am optimistic because a compromise is visible and I think it will be reached very soon.

There are two elements in financial assistance. First is financial protocol to the agreement, something similar to the case of Greece and Turkey and some other associated countries with the Communities, and second is a budgetary line – the Community each year will grant resources for assisting Poland with economic transformations. In this part of the agreement we would also like to have Community assistance for introducing external convertability of the Polish currency. That, we will plan for next year.

With regard to services, the basic positions are a little different. There is the chance to compromise, but then we will have to add to the agreement some clauses protecting Poland and protecting the Communities from invasion and protecting each from the service sectors of the other. The Community is comparatively much stronger in such services as banking and insurance, Poland is relatively strong in construction, in transport services, etc. If you will agree on those measures and clauses based on the principle of penetration of the market and the level of penetration of the market, I think in this month or at the beginning of July we can reach compromises with regard to services.

At the very end I would like to mention the most difficult issue, that of the creation of a free trade area. In our initial proposal, the memo from the Polish government, we suggested creation of a free trade area and customs union in eight years, thus allowing Poland to become a full member of the Communities close to the year 2000. However the Community proposal put a plan only for creation of a free trade area in 10 years, in two stages, but this stage approach has now been abandoned. So now we speak about creation of free trade in 10 years. Two weeks ago at the Ministry of Foreign Affairs, Minister Skubiszewski delivered, to the member countries and to the Head of the Delegation of the European Communities in Poland, our proposal regarding the creation of a free trade area. There we suggested the speed and the scope of this free trade area. Our intention is to have completely free trade between Poland and the Communities in 10 years, but we would insist on creating this area for basic goods in five years. There is a compromise with regard to industrial products, to create a free trade zone in five years, but there are some difficulties in so-called sensible areas such as textiles and agricultural products. It was always a problem for the Communities to negotiate those items with any country in the world, so it's not a surprise for us. In our proposal we offer to create a free trade zone for textiles and agriculture in five years, with some commodities that will be liberalized in a longer period of up to 10 years.

The reaction of the Communities to this proposal has, for now, been very positive. I was told during the recent round of negotiations that there is a lot of room for manoeuvre, but respective Director-Generals of the Commission must go through all the proposals and examine the list of products attached to our proposal. Anyhow from the reactions I had from the Communities two weeks ago I may say that I am optimistic because there is a good chance of finalizing negotiations, maybe in July. Everything is now up to the experts, who are discussing such important issues as rules of origin, public procurement and many other sensitive issues to be placed in the future agreement. We also have very sensitive items in the future agreement on trade and dealing with intellectual property protection.

As you know we in the Polish parliament are now finalizing ratification procedures for a Polish/US Treaty on economic co-operation. One significant chapter of this agreement deals with intellectual property rights, and that chapter will be in agreement with the Communities. I think here it's a compromise between a Polish side and a Communities side and agreement is also very visible.

So to sum up, I think there will be a good chance of reaching an agreement during the next, the sixth round of negotiations, that will take place in Brussels from 8-11 July (we have planned a marathon session for four days). This will be based on results and discussions between experts of two parties because negotiations are on two levels, experts level, which is very technical, and plenary level. I think that we are very near to reaching the goal of the Polish government and the Communities as well as to having a European Treaty initialed in July this year. Of course, it is conditioned to all those discussions, and there may also be trouble with some of the sensitive items. There are many countries that have reservations with regard to certain items in liberalizing trade with them, but nevertheless the will, political will, from both sides is there to reach that goal as soon as we can. We now have strong support and strong political backing from all sections of the government, from Community countries, from the Community itself–Jacques Delors and Frans Andriesson personally, so I think this political support will make it easier to bridge any gaps. I am counting very much as well on the visit of President Walesa at the beginning of July. He will have direct discussions with Jacques Delors during dinner and it may ease reaching the final target, the initialing of the agreement. Negotiating the treaty, we are co-ordinating all our efforts and having close discussions with Czechoslovakia and Hungary because those two countries are also negotiating their respective treaties with the Communities. Their level of advancement and the negotiations are quite different and some problems are different in those agreements. Nevertheless the general scope will be more of less the same – to create a free trade area in 10 years.

The strategic goal of Poland is to become a member of the Communities, but in the agreement we are not giving any deadline for it because it still depends on internal development, internal change in Poland. If the internal process of economic re-adjustment and restructuring will speed up then it will be easier to ask for future membership in 10 years or in a decade or two maybe. If the internal situation evolves slowly then this target and this final goal will be reached later. Nobody gives any deadline for it, but I think that now the idea of East European countries joining the European Communities is widely accepted between political leaders, the problem is only how fast and on what terms, and what the conditions for this future accession should be. We are acting towards this goal not only through the agreement, but we believe, and we know, the major efforts being made inside the country. I mentioned already the harmonization of legislation, the Polish government. The Prime Minister himself, knowing the importance of the problem, appointed last year a special officer for European integration. He is now working on a book, showing the distance in various fields between Poland and the Communities and we will do everything from our side to bridge this gap as soon as we can. Of course in such fields as legislation it does not need too much money, but in some other fields foreign involvement will be needed, foreign direct investments, to speed up economic developments in the country. If all those processes go positively and if the general strategy of the government is continued, then once again we will consider the problem, we will study possibilities and ways to accede to the Communities in the shortest time given a certain transitional period, as it was in the case of Spain, Portugal and some other countries.

This has been a short description of how things look now. The Treaty with all appendices will have more than 100 pages and it will be very difficult to go through it point by point trying to analyze every problem in negotiation in a future Treaty. Nevertheless I think we have agreed 2/3 of the Treaty and we will very soon have a good base for future co-operation by Poland and the European Communities and a very good base for preparation for future accession to them.

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The academic initiative

Joanna Warpechowska
NASK Warsaw University

I am going to talk about academic and scientific computer networking in Poland. Activities on a computer network in an academic and scientific environment were initiated some years ago concurrently in Warsaw and in Wroclaw. After the preliminary work the thoughts were combined and now almost all major academic circles have joined forces in studying and constructing networks. As a result of many years of work, national hardware and software consistent with the ISO/OSI model was created.

Designing hardware and software that relays transmissions according to protocols X25 and X29 was especially important because there were, and still are, difficulties with buying this kind of software on the Western market. Training groups of professionals able to build and maintain networks also has particular significance. We think the existence of such groups is crucial for achieving the planned effects at reasonable costs. Work on computer networks in academic and scientific environments was financed by the Ministry of Science and Higher Education and later, after its liquidation, by the Office for Science and Technology. During correlation of these works prototypes, networks were made and some organizational changes were done making it possible to pass to their exploitation stage.

In March 1990 we had got a message that the US Department of Commerce would agree to connect Poland to the EARN BITNET network. In April, during the visit of EARN President, Professor Grisner, we learnt that EARN members voted for introducing Poland to their EARN community. We then started to construct our network. In June we built a direct connection to Copenhagen and in July we began test exploitation. Since August 15 1990 Poland has officially been a member of EARN, and since then the number of network users has been rapidly increasing. We would like to emphasize once more that fast construction of a network and easiness of achieving exploitation is a result of having experienced personnel and of existence among users, especially among physicists and people acquainted with computer networks. Co-operation with a Swedish company was also very important. This company equipped us with the Netland devices, earlier Netway, enabling connection of all computers to the X25 network. Such equipment is successfully used in the EEC headquarters in Brussels, Luxembourg and in Strasbourg. We appreciate the exchange of experience allowing us to test the compatibility of our teleinformatics solutions from Western Europe and the USA. We found out with satisfaction that our independently-made devices and programmes can co-operate with Western networks without major problems.

In April this year a regular organization of computer networks in the Polish scientific and academic environment was established, which, after further transformation, will constantly develop and exploit them.

Now we are going to outline the present organizational, legal and technical status of this network called the Academic and Scientific Computer Network. The basic

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network is created on the basis of hardware and software acquired during the realization of research and development programmes 8.13 and 8.29. The scientific and academic basic network is the whole of the technical and software means used for interconnecting terminals, local networks and house computers in Poland and connecting them to the international networks with the restriction that only multi-user devices are present in the network.

The basic network is composed of at least telephones, regional and inter-regional lines (as well as international), line devices like modems, converters, packet switching nodes, packet assemblers, disassemblers, routers and bridgers, gateways and network management devices. House computers, independently of their kind and function, and local networks connected to the basic network, do not belong to this basic network. The basic network forms an infrastructure for informatic systems of academic and research institutions and therefore it is financed by the research committee from funds allocated to technical activities. Communicational devices connected to the basic network used by single users are financed by these users.

Contracts to maintain the basic network is made between the research committee and the Warsaw University where a Basic Network Co-ordination Group exists. The decisions on the main direction of activities and general budget for realizations are taken by the Co-ordination Group which also administers expenditures for international co-operation and educational activities. Besides the Co-ordination Group the Basic Network Users' Council has been established. A basic information network integrates in a natural way, the users environment imposing at the same time many restrictions. That enables co-operation via computer networks. We expect that the Users Council will be the forum of information exchange and will put the pressure on the basic network managers to achieve best results. The members of the Users' Council represent centres connected to the network like EARN nodes, communication nodes and groups of local networks. A four-person executive committee of the Users' Council was also elected.

At the head of the organization maintaining the basic network there is the main technical manager. The main manager acts directly through the operator groups, the telecommunications group and the maintenance group, and indirectly through the joint ventures company NASK and the enterprise test. Network operators are organized in regional groups. At the head of each regional group there is a manager responsible for networking this region; operators in the region are responsible for the elements of regional network assigned with the agreement of the main manager. The operators group manager has at his command a group of duty officers assuring 7 days a week, 24 hours a day working of basic network nodes. The telecommunications group operates directly with PTT on constructing control and exchange of telephone lines and devices connected to them.

The joint venture company NASK maintains the basic network devices, organizes the development of the network for new users and organizes commercial use of the basic network. The company has been created as a joint venture with capital left after the completion of earlier research and development programmes, and foreign capital of the Swedish company Data Delecta International Sapia. Hardware maintenance is the task of the enterprise test that had been doing this during realization of the above programmes. Because of strictly technical activity alien to the specific aims of an academic institution, especially a university, this solution is the most effective.

Four communication protocols are realized in the basic network. They are suitable for different kinds of devices connected to the network. Protocol X25 is the basic protocol used for connected terminals, host computers and local networks via a packet network. Protocol is used for connection between IBM machines and their remote devices if they do not interface to an X25 network. Protocol DecNet is used for connecting Vax machines that are not equipped with routers in interfaces to an X25 network, and Internet-based protocols are used for local networks.

Now I'm going to show a typical connection by a leased line inter-city connection. On both sides there are statistical multiplexors that can serve four protocols sending packed data in their own protocol close to HDLC. The speed on all four channels is 9600 bits per second and, for example, this protocol may be DecNet for connection. The protocols served at present are DecNet protocol for connecting Vax machines, Internet-based protocol is the Polish product for connecting local networks via workstations, and BSC protocol connects IBM machines and X25.

Here we have the local network connected via a kind of gateway to the X25 and it may be connected also to the IBM machine. The basic network contains nine regions–inter-regional and one international connection to Copenhagen. With inter-regional connections the channels for all protocols are made by installing four ports that host multiplexors with data compression. This multiplexor serves the four protocols sending packed data into your own protocol. The international connection from Warsaw to Copenhagen serves two protocols, BSC for the EARN network and X25 for connection to the data pack in Denmark and on to the world.

At present the line works at a speed of 9600 bits per second. Activities on establishing a new connection working at a speed of 64 kilobytes per second, also multiplexed for several contemporary protocols are in progress. Here is the map of NASK connections in Poland. There is one international line to Copenhagen and several lines connecting different cities and different regions. These lines, blue and yellow, are completely done in multiplex; these two connections are in a state of multiplexation. Some of them are not multiplexed and the works on establishing the new connections are in progress. In all regions there are connections in the territory of cities and inter-cities; present lines work at a speed of 2400 bits per second and 9600 bits per second. In the close future all of these lines will be adapted to work at speeds of 9600 bits per second and the speed 24 will be used only for dial-up lines.

The basic network now has over 3,000 users in the group of users. It connects 10 EARN nodes – further nodes are being prepared. At present the basic network offers several services including three, and in the near future four, kinds of e-mail, the most popular being EARN BITNET mail. Also available is MVS on Vax machines and Unix Mail on Unix machines. In the future there will be connections to business worldwide Memomail. We also offer a file transfer in EARN and on the direct intercomputer connections. As well as the telnet function enabling terminal access to computers and file servers for machines accessible by X25 protocol and in the future by TCPIP,

The academic initiative (2)

Jerzy Tetyk
IBM

Good afternoon ladies and gentlemen. I think that my short speech will be a natural continuation of my colleague's lecture since I will also be speaking about computers and about the academic milieu. There were a lot of projects concerning the presentation of IBM to this public. However, without hesitation we decided that the subject that we want to discuss is the IBM initiative addressed to the Polish academic and scientific milieu. In our firm we call it the IBM Academic Initiative.

On 24th May 1991, the Minister for National Education and the representatives of 14 Polish Universities signed an agreement about the co-operation with IBM. In this way they initiated a project to computerize Polish Institutions of Higher Education on a larger scale. Owing to this initiative the Polish academic and scientific environment will receive the most modern information technology. The Centre for Scientific Calculations of the University of Warsaw will be equipped with modern computer stations, with most modern software, both systems and applications software, suited to the needs of the Polish academia and the developing economy. In addition IBM will provide expert training for the computer operators and free service.

The Polish side will contribute to this initiative by providing at least 12 subjects for research papers of great importance for the economy of our country. IBM expects that its contribution (in this scheme) will be documented in the form of appropriate dedications.

Now a few technical details describing the IBM Academic Initiative. A 3090 ZJ processor will be installed in the Centre for Scientific Calculations of the Warsaw University. For those unfamiliar with the subject I would like to explain that it is a very powerful computer system. We haven't got a similar one in Poland yet. The CPU will be equipped with a large memory, many peripheral devices, microcomputers, printers, tapes. The teletransmission controller, which will allow the system to be used by Institutions of Further Education from and outside Warsaw, will play the key role in this computer configuration.

Thanks to this communication processor and to this new system the Warsaw University and other Institutions of Further Education will have a second connection with the academic network ERNET. The second connection will accelerate and relieve the "traffic" on the first one. I would like to show you now how the IBM Academic Initiative will look. This initiative is addressed not only to Poland but also to other countries. As you can see Warsaw, Budapest, Prague and Belgrade are marked with a black square on this map. Similar installations are planned in Sophia, Bucharest and Moscow. The area of IBM activity doesn't comprise only Poland.

The introduction of this system is scheduled for 1st October. This year the Warsaw University will receive equipment for two laboratories. These will be microcomputers directly connected to this system. In this way we will create a model of a laboratory or

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a presentation room. Next year this model will be duplicated in three other academic centres outside Warsaw. This is how the first part of the IBM Academic Initiative presents itself.

I just wanted to add that this agreement expires in two years time but there is a possibility of extending it. I called it the first part because there is also the second. It is an offer which we call "an academic window". This IBM offer for the academic milieu means that Institutions of Further Education, students and research workers will be able to buy equipment and software for very attractive prices, with large discounts. We are often asked if this IBM Academic Initiative is an investment, gift or whether it is a "joint venture". It isn't any of them. The IBM Academic Initiative is a joint project. I call it joint because both sides contribute to it.

Another question asks why IBM does this. We know that the Polish market has a great absorbative power and a great potential. There have been three main factors which have limited the possibility to make business in our country: the limitations imposed by Comecon*, financial difficulties, and information and technological barriers. The Academic Initiative intends to alleviate this last one. It should result in an increased degree of knowledge about information technology both in the Institutions of Higher Education and outside. The initiative is the acknowledgement of long-term involvement for IBM in Poland.

It is a considerable contribution to our economy and a chance for the development of Polish applications written in Polish. This is in short the essence of the IBM Academic Initiative. Thank you very much.

*Comecon – Council for Mutual Economic Aid: the equivalent of the Common Market for the USSR satellite countries.

The academic initiative (3)

Mr Jacek Duch
DEC

First let me thank you very much for inviting us to attend the conference. Digital Equipment Corporation formally opened its operation in Poland two weeks ago after having been absent here in the country for the last 10 years. Still I believe I am able to say that we are very popular as a computer systems and networks manufacturer, not only in industry but in the academic and research community.

I would like to divide my presentation into three basic sections. First I'd like to tell you how Digital is trying to combine fundamental research with market needs and for that we use what we call Digital Computer Centres. Secondly, I'd like to let you have some insight into how Digital Equipment co-operates with academia, that is research and development institutions, and we hope to start these activities fairly soon in Poland. And thirdly, would be what my pre-speaker called an academic initiative, which Digital, as one of the major players in the IT technology field, also has to offer.

Let me start with a link between the market, including academic needs, and our engineering. We are organized in Europe around so-called Computer Centres. Having established our centres we try to really analyze the market, the user needs, and through these DCCs to relay these needs to our research and development department.

Doing so we believe we are in a position to offer the best suited solutions, not least because these solutions are being developed and they have the participation of research institutions.

The sector that is of primary interest to the university community, we call the public sector. It is located in Brussels, but that is just an organization issue and as you see here the main areas of activities are research and development and education. We run on a regular basis, twice a year, meetings and sessions where major European research institutions, universities and high schools convene, together with our people to look into the future a little bit and find out how these two worlds can best co-operate. The result of this ongoing co-operation between the university and the research administration is the framework for our engagement in R&D and education.

The first topic is what we call high level co-operation, that is research and development, and the vehicles we use to implement this are the European external research programmes. Secondly we have already established several compass-based engineering centres throughout Europe, CECs we call them. In various countries we conclude separate individual agreements with research and development, mainly focusing on testing new products. This has been the case in the Western world for many years now, and we are just about to start this is Poland. Obviously the issues like translation, local languages and so forth are important for operations in a given country.

Something which is not being publicized very widely is that we operate sabbatical possibilities to researchers that we intend to co-operate with. In the area of pure educational co-operation we intend to initiate this in Poland fairly soon and in fact the

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basic agreement between Digital Equipment and seven Polish universities has already been signed. We co-operate on putting together curricula and also providing the universities with tools to realize those curricula. The seminars are sponsoring theses by graduate students, contributions to our student co-operation by accepting trainees at our facilities, or other elements of the programme.

I am not addressing specifically the issues pertaining to Poland. I will do that at the very end of this brief presentation, because the basic message that I would like to get across is that we intend to contribute to the process of change in Poland and other central and east European countries right now. But basically Digital intends to be established in Poland as Digital is in any other western country. I think that is a very fair approach. We understand some support in financial terms is needed, but basically all the countries should be treated at the same level.

Digital is an American company but, in fact, that's only half true; both in terms of revenue and in terms of research and development Digital Equipment is a European company. The overhead here shows that our highly developed advanced products are being created in Europe and in the US. I wouldn't want you to think that Digital is shifting from the US into Europe; we are equal partners.

Now, where do we address the research and development community, the academia, in the product development cycle? Where we have our programmes running and sponsored by us is basically the stage in the applied development, or, better still, the step in between applied research and advanced development. This is being organized within the framework of an external European research programme and in Poland we are just about to sign two agreements with two universities to initiate this programme. We are not publicizing this because the formal agreements haven't been signed yet, but frankly, we are after the research and its results and not the publicity, which is probably not the best future for Digital. We take it very seriously; we expect both our partner, a researcher or a research institution, and Digital to benefit from the mutual programme. The way it functions is that we try first to find mutual interests within our engineering and development groups and corresponding research institutes elsewhere. Obviously we have to make financial means available to implement the project, just financing simple things like attending seminars abroad, covering travel costs and also putting equipment at researchers disposal. Equipment, in this case, means computers and related software. After the project has been concluded we usually agree to be in a position to mutually use the resource, both in scientific and commercial terms so we are not entering into any exclusivity relationship here and the results that we have from elsewhere in Europe show that this approach is well accepted by both parties.

The external research programme is project, or single-task oriented, or problem oriented if you will. We run it on a continuous basis, in computer-based engineering centres, and on the screen you see that we are already established in Europe. One that I can tell you about, because I spent the last few years in Vienna, is the Technical University of Vienna, where the department of Professor Selberherr was instrumental in helping Digital bring Microvax 2 to the market substantially sooner than we would have been in a position to do on our own. This gentlemen is an expert in thermal processor simulation and that was his contribution; our contribution was that the

University of Vienna was one of the first users worldwide of the most powerful Vax that we had at that point in time, the 8800. If you can see it, well, this is the compass-based engineering centre in Switzerland where we were closely associated. As you see there is a fibre optic-based network throughout the city with many academic and research institutions connected to it.

We are in contact with many Polish universities and I am pleased to tell you that there is an academic user club of our systems, the DEC User Club, which was founded about two months ago and is run by the Technical University of Liviza. We hope to be able to establish very soon a very close link, both in terms of single individual research projects and hopefully also in terms of establishing a computer-based engineering centre in Poland.

Now to conclude I would like to address some issues that are probably only related to Poland and other East European countries. Our basic philosophy towards the academic and educational market is very much like this one presented by my colleague from IBM. For academic users we have a very attractive pricing policy, especially in terms of software, where the licence fees are being brought down to 10% of the list price. In practical terms it means what we are charging simply administrative and handling fees, because we believe software is the real tool for the universities, not necessarily the hardware. Digital is one of the major suppliers in the networking area and applies a special discount policy for network devices to be bought by academic and educational users. Normally we provide discounts of 35-40% for network devices, it's just half the price. This is not just for Poland – this is for any country in the world whenever we speak to a university.

What is specific is our support for the scientific network within countries like Poland, Czechoslovakia and Hungary. And I am pleased to tell you that just two weeks ago we installed the first X25 server at the University Liviza, running the X25 protocol and being able to serve all the systems located at this university. This was obviously owing to favourable approval of our application, but is already running and this is one of the vehicles that we think will facilitate communication between the universities. We are also in the process of establishing an internal digital systems network in the south of Poland, north Bohemia and Hungary. All these are based on Vaxes. Each of these Vaxes is being equipped with Janet interfaces, which means having a very good interface into the EARN network and this is what the academic world is actually looking for.

Concluding, I would like just to mention our latest initiative, E4. E4 stands for Education and Equipment support for Eastern Europe. This initiative was born by many Digital employees of Polish origin, myself being one of them, located in various places and trying to utilize the inflexibility of the company to make the equipment available to the universities and schools in Eastern Europe. This is a pure donation programme that is delivering systems and charging nothing for them.

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Question time

A delegate
I have a question both to IBM and DEC. I understand that you have fantastic programmes for the academic society in Poland but the question is whether you can co-operate with the existing resources. Today we are talking about the future. We are talking about very nice programmes in the future. The Academic Network is now. It is a reality and the question is if you can include it in the future in your programmes?

Mr Tetyk
I am sure that you remember the drawings which were shown by my colleague from the University. On the right side of the drawing you will have noticed a 4341 computer and 3705 communications controller. That's the answer. We are providing similar equipment but high technology. So there is no question of uncooperation.

Mr Duch
If you could specify what you mean by co-operation......

A delegate
What I mean by co-operation is exchanging experiences because there is a lot of experience in the Polish market of telecommunications. Of course there is a lot of old-fashioned equipment but this equipment is still working and if you can provide newer equipment it will be much better. But I mean using resources and human resources as well.

Mr Duch
That is exactly what we are doing. The X25 based private University network which is in use in Poland is built around Vax clones. What we are doing now, and this process is half-way through, is bringing these incompatible systems at no costs to their actual Vax level, enabling them to run the latest version of the software, because it is the only way for you to co-operate with any western university. We are also supplying the communications devices and in terms of personnel, in the last three months we had twice-weekly visits from specialists, from experts from Polish universities, discussing and implementing various ways of working together. One of them being simply, to have the remote location doing service and installation for Digital, which is a very trivial form of co-operation, but still this is the training-on-the-job approach I would say. And also we will be addressing several big projects in Poland using local resources obviously.

This is very seldom stressed, but nowadays, and I believe my colleague will confirm this, the computer makers are making more and more money out of the service area than out of hardware manufacturing. This is our policy for Poland to have the services being delivered here, provided by local personnel either from Digital or subcontracted. This is the way we see the co-operation developing.

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Chairman
Are there any more questions to IBM, DEC or the University. Yes, please. Could you please say who you are and also which firm you represent.

A delegate
I am the technical manager of N.A.S.C network. I would like to say that an impression has been created as if some disagreement existed among DEC, IBM and N.A.S.C. Mr Duch mentioned the initiative in Gliwice University of Technology called DECUS which is a joint initiative with IBM. I believe there are many opportunities to co-operate. I am optimistic. But I would like to say that working on very specific Polish telecommunication networks requires great and very specific skills maybe not encountered anywhere else. There is a general opinion that one can't work using Polish telecommunication networks, but we work and we work quite well. It results from the fact that we in Poland lack a general technical culture. In the places where the decisions concerning the telecommunications network are taken, people are not properly prepared. But if we assist them with our knowledge then we can work quite well on this not particularly good telecommunications infrastructure. Thank you.

A delegate
I would like to ask both gentlemen to tell me in a single sentence whether they have a strategy to introduce open systems into the Polish market. We know that DEC suggested Dec Station and IBM are selling computer RISK 6000. And the second question, is have you any plans to introduce corporation networks?

Jacek Duch
As far as open systems are concerned, on leaving here, could you please have a look at one of our terminals on which you can see an example of how an integrated local system, or an open system, can be set, which would enable co-operation of MS-DOS, OS/2, Mac, UNIX, VMS and other systems. This is equipment which Digital provides today. For the future, I don't think I have to emphasize that there is no alternative to open systems and Digital Equipment is one of those companies which proposed it and implements it.

Your second question regards corporate networks. Yes, Digital and other firms have their strategies, which now are related less to technical infrastructure but rather to the way those companies function. There are a few similar installations now introduced in Poland, in which enterprises, firms situated in various places have something which may already have the rudiments of a corporate network. I also share your opinion that despite negative appreciation of Polish telecommunications networks, we manage to establish connections which at first sight would seem impossible to function and this is the basis for implementing corporate networks.

With regards to the strategy, it is difficult to talk about it. This is something for a more distant future. FFDI is only the backbone and it is not itself the philosophy of the network. It is more an administrative and economic rather than technological issue.

Jerzy Tetyk
I would like to invite you to tomorrow's meeting, tomorrow's seminar on which an IBM project, comparable to corporate processing, will be presented. With regards to open systems and products, than as my colleague has already said in his previous presentation, all firms now make big money on the service. However, the products of all the firms all over the world are able to "communicate" with one another. I understand that we have to look at computer systems as a means by which we can access information recorded somewhere else.

Chairman
And the last question, please?

A delegate
In fact my colleague has already asked the question I wanted to ask. However, I would like to rephrase it. In my opinion today's sessions have been uncoordinated because the first part revealed how great the hunger for managerial information is in Poland, the second showed a great support for research centres in terms of software and equipment at relatively low costs for Poland. But in this case, it seems natural that commercial use of this equipment and access to information may turn out to be so expensive, that in the situation in which the Polish economy is in now, we won't be able to afford it. Perhaps tomorrow's session will disperse my doubts?

Chairman
I hope you are right and tomorrow's session will do so. We have heard how information technology may help Poland's business people of tomorrow but just as important are today's business people seeking to expand their trade operations. As we heard in session one, the Business Co-operation Network is an existing and effective way of promoting Polands' businesses in Europe. We are very fortunate to have Mr Hamelinck from Brussels here, systems manager of the European Communities BC-Net system who will give a quick presentation on the BC-Net system before actually opening the BC-Net system to Polish organizations. Mr Hamelinck.

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BC-Net: today's tool for building international trade relations with Poland

Eric Hamelinck
DG XXIII of the Commission of the EC

You will have seen in the programme the abbreviation BC-Net. Well, BC-Net as an abbreviation stands for Business Co-operation Network. Network seems to be a trendy word, but networking is the way of opening the future and in fact BC-Net as a business co-operation tool has been built upon this idea of networking.

Let me explain to you what BC-Net is. It is nothing else but a system, an interactive system. That means it is a network of business consultants sitting in various countries, and in various cities inside these countries who can make use of a computerized system. It is in fact a technical tool, a computerized system that stands in Brussels. This system was developed by a division of the European Communities Services, but what was the idea behind all this? Well, the idea is to get specialized help in the immediate area of businesses or companies, companies who are looking for partners for inter-regional and or international co-operation. It is in order to develop their own business, in order to expand new markets, in order to look for new markets to sell their products to, but also in order to come to eventual financial co-operation or even technical or technological co-operation. So, BC-Net is a tool to assist mainly small and medium-sized enterprises in their search for partners for inter-regional or international co-operation. This tool, this system, is in fact given to a great number of business consultants who have been selected by the European Commission Services. That is the definition of BC-Net as a system, as a tool.

Now where is BC-Net working? Well, BC-Net was set up in July 1988 and we started it up in the first phase in the 12 countries of the European Community. After a two-year experimental phase we have extended it outside of the European Community and today we are working in 22 countries, including Poland. We have also recently opened national contact points in the six EFTA countries. Since the end of last year we have had contact points in Mexico, Brazil and Tunisia and we will have, we hope, by the end of this year, openings in Czechoslovakia, Hungary and Yugoslavia. Another extension is foreseen for the beginning of next year to Australia and to Canada.

So you can see that BC-Net, as was rightly said by the President, is a tool that is already working and is working well. We have received a lot of interest in participating in this network that is no longer a European Community network, but Europe-wide, and indeed, is almost a global network for assistance to small and medium-sized enterprises.

It is also important to say that BC-Net is not a kind of static tool, it is not a tool that is just governed by an official administration, i.e. the European Commission, it is a tool that is developed thanks to its users. To date we have 760 users in these 22 countries and it is thanks to all these individual users that we can develop BC-Net. So we can expand its application possibilities, we can work on the future development.

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It is also very important to know that it is thanks to the interactivity between members and the central service of BC-Net that we can develop it towards the future. One of the ways of working together with our members in the various countries is to have, on a regular basis, contact meetings, small technical working groups with representatives from each of these 22 countries. These contact meetings allow us to discuss technical administrative things or other things alike, and in addition to this we also have an annual conference. That takes place every year in a different location. Last year we had our first conference in Brussels, this year we will have it on the 4-5 July in Paris, and there will be representatives of the Polish BC-Net intermediary there. The conference title this year is *The New Dimension of Co-operation in View of 1992*. It seems a little bit of *déjà vu* because everything today happens in view of 92, but the conference must have a title. Much more important is to know that there are three different topics in the conference, the first one being the quality and the expertise of BC-Net. We must be sure that for a tool like BC-Net there is a very high standard maintained for the input of partner search profiles. The second topic is technological co-operation – we would like more and more to move towards this technological co-operation because it is so important for the future. Finally, there is the third topic which is co-operation between community countries and non-community countries. So promoting this, and you can even see this a little bit in the STAR Programme, the programme of assistance for Eastern European countries, it's also very important to know that there is also a practical tool that can be used for the application of programmes and things like that.

Well, I can say as a concluding word, that the first steps have already been taken. I was here in Warsaw a little less than two months ago to give training on the use of BC-Net. I have seen quite a lot of the local members of the Polish network already, so I have given this training in order that they know how to use BC-Net. We have already reached the second step – our Polish contact here in Warsaw has already got a computer connection to our central computer in Brussels, and it works! We will give you a demonstration at the end of today's session, but Mr Borowiecki will tell you a little more about is afterwards.

So in just a few months preparatory activities have already been done and we can say that today BC-Net is running in Poland. I can tell you that I am happy personally because we had the first contacts one year ago at the first annual conference in Brussels. In the beginning no-one would have thought that in less than one year we would already be there with an open office in Warsaw. Well ladies and gentlemen it has happened in less than one year – in a little more than nine months we had all the offices prepared, and had got the training sessions underway. So this is BC-Net today. I don't have anything to add to this, the only thing I want you to remember is that BC-Net is a tool for assistance to small and medium-sized companies mainly, but you can also have assistance to big companies although they have their own ways of finding partners and so on. So it is a tool for assistance in partner search, not only in the European Community, but in Europe and abroad.

BC-Net in Poland

Andrzej Borowiecki
Central Planning Office, Warsaw

Ladies and gentlemen. I have the honour to speak at today's EUROINFO conference on the day of the opening of BC-Net (in Poland). I would like to say more about what BC-Net is and how important it will be for small and medium-sized Polish companies, which in a time of economic and property changes are looking desperately for partners for economic co-operation all over Europe and the world. Poland has the honour of joining BC-Net as the first country from eastern post-communist Europe. As Mr Hamelinck has mentioned, other partners such as Czechoslovakia and Hungary will soon join BC-Net, as well as other partners from outside Europe.

The BC-Net structure in Poland will be star-shaped. One organization has been chosen to co-ordinate the whole work of the consulting firms functioning within the network. The Information Technology Centre of the Central Planning Office will be playing the role of co-ordinator, but the main work of this network, its success in Poland and the effectiveness in associating Polish and foreign partners will depend on the work of the local consultants. Local consultants in BC-Net are consulting firms whose task is to maintain direct contact with enterprises, advising them on the choice of new directions in the economic development of the enterprise and in the choice of markets.

First of all we are establishing a network based on a few consulting groups or organizations which already have got some experience in searching for economic partners for Polish small and medium-sized businesses. This network is not complete. We will broaden it gradually so that our activity will cover all economic areas of Poland. For the time being we have signed an agreement associating BC-Net with a few organizations such as the Business Foundation, an economic foundation "Solidarity", the Poland Exports Foundation, Polish Business Offers, the Polish Foundation, a co-operative "Advisor", Tailor Consulting Ltd and Euronet . We are in the process of signing an agreement with other consulting firms – Business Contact from Warsaw, Insbud from Bielsko-Biala, Orgmasz from Warsaw, Wertim from Lodz, and others.

However, our talks with them are at various stages, because before a consulting firm joins BC-Net it must be well and thoroughly informed on the activities of the network. The BC-Net associative mechanism is different from the associative mechanism in another system working under the auspices of the EEC called BCC ie the Business Co-operation Centre.

BC-Net associates the business profiles of Polish enterprises entered into the system by the consultants. A company should give reliable information and the reliability of information about the company must be guaranteed by every consulting firm working in the network. In return, BC-NET guarantees that the information which enters the system is confidential, for those Polish companies which express such a wish.

The success of BC-NET in Poland depends on how serious those offers are and how well they are prepared by the consulting firms; it is not enough to express a wish to gain

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something (out of the co-operation). This offer must be specific. It would be good if the enterprise had a prepared project and specified its expectations.

The majority of Polish companies are looking for a partner to establish "joint ventures" or other institutional forms of economic co-operation. Nevertheless, BC-Net also deals with searching for dealers who would distribute Polish products all over the world. BC-NET does not restrict its activity only to the EEC countries. It is a network forming a live system. This system is being constantly developed. At present apart from the association of companies, a new initiative came from the management of BC-Net intending to associate first-class specialists with firms looking for this type of service. Similarly, if in Poland there are experts who find it difficult to utilize their professional qualifications they can submit their application to work abroad to us and we will hand over such offers to BC-Net.

If a Polish company requires first-class European specialists we can report such a request to BC-Net. However, BC-Net does not have much experience in this field and we will see how this idea will develop. We are mainly attuned to co-operate with small and medium-sized companies.

I wanted to say that the main link in our Polish chain will be a local consultancy. A local consultancy, as BC-Net perceives it, is an organization providing a broad range of consultative services to Polish businesses. One of those services is associating a Polish company with a foreign partner. However, on the border between a local consultancy and a company, there should also exist other forms of consultancy services such as advice on the choice of a new economic strategy for a company, as well as the preparation of the feasibility study.

Polish consulting firms should also be ready to assist companies in the final negotiations with the European partners. In many small companies it is difficult to find an expert with a good knowledge of foreign languages who could discuss the conditions of the future contract on behalf of his company. Consulting firms will also play such a role for Polish small and medium-sized companies. Consequently, BC-Net is an extremely important and welcome instrument which can assist a lot of companies in solving many difficult problems.

In every BC-Net local consultancy there will be authorized people responsible for the technical side such as properly completed application forms which will be submitted via the Information Technology Centre to the head office in Brussels. Those application forms, called co-operation profiles, are matched every day in the central computer unit in Brussels. Consequently, every day we can expect an answer if a partner has been selected by the computer. This process is automated.

Irrespective of the information exchange within the BC-Net system, the very fact that Poland appeared in this network evoked a lot of interest in our consultancy firms and the Information Technology Centre of the Central Planning Office. The information which comes from expert consultancies will be mailed to all the consulting firms working in this network by the Information Technology Centre of the Central Planning Office.

At present those firms do not have an organizational structure which would ensure that the whole country would be covered evenly with the network of consultancy services of this type. We will ensure that there are no unclaimed territories on the map of Poland and that BC-Net as an instrument of association reaches everywhere. As you may have noticed from the names of the consultancies which signed agreements with us, they are mostly concentrated in the coastal area and in Warsaw. However, some of them operate on a very wide area nearly covering the whole country. We want every branch of economic activity to be covered by the consultancy services.

I would not like to prolong my speech too much, because I believe that those who are interested in technical details regarding the work of BC-Net or the submission of co-operation profiles to the head office in Brussels, can ask about all this either during the cocktail, which will add splendour to the opening of BC-Net, or at any other time contacting the managing director Mr Henryk Roslanski or me at the Information Centre of the Central Planning Office. Thank you very much.

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Question time

The official opening of the BC-Net system took place and the Business Foundation handed its company profile over to Erick Hamelinck. Afterwards questions were put to Mr Hamelinck and Mr Browiecki. The session was chaired by Adam Piekarski of the Business Foundation.

Krzysztof Zieba from ART-B.
I would like to ask a question of a technical nature. On what computer is this achieved and can it work locally connecting partners in Poland without sending this information to Brussels?

Mr Hamelinck
First of all let me tell you that the system is centrally run in Brussels on a Siemens-Nixdorf Targon system. The operating system is a Unix-Oracle configuration. That is one thing. The second thing is that the members who are linked on the BC-Net system receive from us the national contact point, a local program. That means that they can prepare their partner's search profiles locally and then transfer it via the X25 linkup that is the international telecommunication to Brussels. They do not, of course, need a Siemens Nixdorf, it is enough to have a PC with a minimum capacity of 25Mb and an MS-DOS operating system. So it is not very complicated and we on purpose avoided being complicated because there was a very wide variety of potential users who were, from the beginning, interested in working locally via computer communication.

In answer to your last question. It is possible to use BC-Net without going via the central system in Brussels? No, because the system is conceived that way, that profiles come in from all 760 contact points and we keep them in stock and whereas it may be said that BC-Net is not a databank you can compare it to an electronic market place where various partners can meet each other, where partners – potential partners, are then introduced by the network. So it is not possible to work with other consultants out of BC-Net without passing via the central system, which does not mean that there is no co-operation or a collaboration between the consultants in the network, but not specifically in the field of partners search via this central system.

A delegate
I have a question regarding the financial side of entering the profile. Will the consultancies charge fees or will the Central Planning Office charge them?

Mr Borowiecki
May I presume to answer this question as Mr Hamelinck does not know the details of the organization of the network in Poland. The organizers of BC-Net in Poland do not want to interfere in financial issues such as the settlement of accounts between the consultancy and a Polish company. We assume that a certain competition will arise between the consultancies providing similar services and that consequently a company

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will select such a firm which acts most effectively and asks for a smaller fee. Because we don't have any way of influencing the accounts system of a Polish consultancy, those firms will themselves establish the sums of money they will be charging Polish businesses for their introduction to the system. Those sums certainly shouldn't be high because this would scare off the Polish companies from using BC-Net. We charge the consultancies with some insignificant fees of about 300.000 zl for the service of one company – a profile of the company, answers and the related correspondence.

Those charges are necessary because the Centre does not get any subsidies. We are an auxiliary institution which partly has to earn its maintenance itself and consequently because we opened an office and bear the high costs of maintaining a constant communication with Brussels with the aid of a telecommunication distributor installed by Norton-Telecom, we have to charge those fees. Otherwise, the whole enterprise would bring losses and whoever would be organizing such an undertaking has to establish some minimal fees.

I would like to emphasize, however, that for the Information Technology Centre of CPO this will not be an enterprise bringing profit. We are an auxiliary and at the same time budgetary institution which receives salaries for its employees from the budget. Consequently, there is no point in getting rich at the expense of the companies as the money we earn is all the same returned to the state budget. We cover only the running expenses and it isn't really our business how high expenses will bear Polish companies in virtue of the utilization of BC-Net. We will try to enlarge the network in order to make this instrument cheaper for a Polish businessman. I think that it shouldn't turn out to be too expensive.

Adam Piekarski
As the question is with fees, I thought that maybe Mr Bogdan Chojna as the first consultant of BC-Net in Poland would like to say a few words on fees and costs.

Bogdan Chojna
In fact, I still can't tell you much, apart from the fact that in our firm the decision regarding the amount for the use of BC-Net has not yet been established. I talked to my colleagues, other consultancies which play the role of agents in transferring and encoding information between the telecommunication point in the Information Technology Centre of CPO and companies, and a general opinion prevails among them that the charges should range from 1 million to a few million zlotys for the single entry of a company, for its introduction to the system. However, I don't think that anybody yet has a clear and decisive opinion as to what fees we should charge. Perhaps one of the representatives of the consultancy firms who, I can see are present here, would like to speak up so that we could close this subject.

Adam Piekarski
Please go ahead, ask your question.

A delegate
It is a question to Mr Hamelinck. What type of information package about a company will be handed over by this system? That is, how it is developed?

Mr Hamelinck
First of all there is a profile that is put in by the business consultant, a member of the network. In that profile there is minimal information. That is the only thing we need to know in order to find a potential partner. We never find ideal partners. We can only find potential partners and then it is up to the consultants to work with it. The minimum information we need to know is, first of all, who is the member who introduces the profile? Secondly, what type of co-operation is required? Financial? Commercial? Technical? In what activity field? Where is your client located and where would your client like to find the future partner? And that is all.

We do not have names or turnovers, nothing at all – a totally confidential system. And that is, in fact, another security aspect of it. We work with computer connections via X25 telecoms and datacoms and so on. Well, I invite all pirates to try to brake into our system – they will find nothing at all except codes and matching criteria. So the total content of our system is in fact worthless for pirates because the basic information on companies themselves are in the offices of our members, and that is one of the main features of BC-Net. It only compares criteria.

A delegate
I have a question about Polish firms being under the procedure of liquidation. Can such firms be users of the BC-Net system because liquidation does not necessarily mean bankruptcy in Poland? It is just one of the means of privatization provided by Polish law. And I think that there will be many such firms looking for partners or for buyers of their property or as partners for joint ventures.

Mr Hamelinck
We will answer both parts of your question in general, so I will not focus on a specific national problem that could eventually exist in this case. First of all, let me tell you that in BC-Net it is possible to sell parts or total companies, in order to sell. But you should not forget, as I was told before by Mr Borowiecki, that before the introduction of the partner search it is the task of the business consultant, member of BC-Net, to make a good analysis of the opportunity that is brought into the network. That means you can only bring in quality in the system. And quality does not necessarily mean exceptionally well organized companies. It can be enough with a company that is for sale but which is not bankrupt, of course. There must be some potential for another future partner to work with it. So, in general that is what we give as a possibility when we talk about financial co-operation, meaning selling a part or the whole of a company.

For two weeks now, the Treuhandanstalt has been a member of BC-Net as consultants in Berlin. And you know exactly, all of you, what the job of the Treuhandanstalt is in relation to the 8000 and so companies that they have in their files. They will not be able to introduce all of these into BC-NET. That is not possible. But quite a number of them after being analyzed and so on and so forth could eventually be introduced into the system.

Mr Borowiecki
You have asked quite a difficult question because a company which undergoes liquidation no longer exists. The land belonging to this company is usually the property of the Treasury. The buildings which remain are the property of the Treasury. The machinery as well. And at that time, when no other owner exists, it is difficult to establish which party would submit to BC-Net a notification that there are grounds, buildings and machinery for some kind of utilization. The basic problems regarding property have to be resolved in order that we could notify BC-Net about such durable means, if I could use such a term. However, then we would also have to specify how the new owners could utilize those durable means for production of one type or another. As a result one has to wait for change in the ownership of a particular area after liquidation and only then can one apply to BC-Net.

A delegate
I have a question to Mr Hamelinck. I would like to know if BC-NET can provide services other than business partners association, for example electronic mail for businessmen or some new currency courses, market tendencies etc.

Mr Hamelinck
Well, in fact I could give a very short answer. The answer is no. But I am going to give a little more detail. BC-Net is a tool that was set up specifically for business co-operation. So the only service we can give is to help you find partners for your clients. This is the tool today but it is a tool that is in a permanent evolution. We are for the time being working on other application possibilities for BC-Net. That means that in the future, and that really means 1992, we will also have the possibility of using BC-Net not only for co-operation between companies but also in the field of human resources. That means between a company and individual persons. We are also developing BC-Net in the field of Research and Development, in view of participation in research programs and so on. And finally we also want to develop BC-Net in the field of subcontracting which is a very specific kind of business co-operation. And I am afraid that is all, that was in fact the original idea, to work out a tool to assist companies in order to help them find a partner. So we do not offer electronic mail services, unfortunately.

Jan Ozerwinski – Video Offer Bank
I have two questions. One of a technical and the other of a strategic nature. I wanted to ask if the classification of industrial activities used by BC-Net is equivalent to the classification of industrial activities used by the European classification of activities now introduced in Poland by GUS (The Central Statistical Office). That is the first question. And the next one is, is there a possibility of complementing the information transmitted by BC-Net with audiovisual forms? It appears to me that Poland, like many

other countries of the east European bloc, is little known among West European businessmen and in order to reinforce the reliability of the offer existing in the database we could supplement it by audiovisual means. We present such a system at the exhibition in the form of a very short film presenting this co-operation offer and complementing it with those elements which cannot be transmitted via the database. Is there a possibility of introducing this form to BC-Net?

Mr Hamelinck
OK. Answer to question number one is: the nomenclatures that we are using are European standard nomenclatures. That means, as the tool was originally developed inside of the European Community we have started working with the NACE nomenclature, that is a French abbreviation for Nomenclature of Activities in the European Community. It is not a worldwide standard, it is European standard nomenclature. We have developed it based on that NACE, developed it to our own needs, but it is standardized. On the second question, it is not possible to pass via BC-Net, complementary information. We only need minimal information and once we have found a partner with that minimal information, of course, we inform our members. We tell them we have found suitable partners and then they know that it is up to them to exchange complementary information and this exchange of complementary information also happens in a standardized way, of course. That means, that those members whose profiles have met will exchange what we call a company activity report which contains more details on the company. And at that stage you can add, of course, videos or other material that can visualize the status of your client.

A delegate
Because the whole collection of information about companies, their activities and needs is stored outside Poland we can imagine a situation in which the hierarchy of answers will be more favourable to Western rather than Polish firms. What are the safeguards for companies that the answer will be favourable to Polish companies? The Polish market is very absorptive. It has many gaps so many companies want to enter it. Won't this network make it possible only for western companies to enter? Won't it block Polish firms?

Answer
The operating mechanism of BC-Net enables this sort of choice, because the mechanism of association functions automatically on the basis of codes. A computer is not a thinking being which would generate answers for Western partners and not generate them for Poles. No one in the EEC can be accused of ill will, because if computer-derived association occurs the computer operators are sure to send those answers to Poland. There is no human factor involved in the decision-making process of whether to associate the companies or not. First of all the business consultants are associated according to the co-operation profiles. Further, the exchange of correspondence takes place between the business consultants and on the basis of more specific information about the company, which they have on their database, the consulting firms decide

whether they should arrange direct talks between the companies. It would be impossible for Polish companies to be deliberately treated unfairly.

Adam Piekarski
So with that we conclude the second session of today's conference. I would just like to say that it has been for me a very optimistic session. Mr Mulewicz spoke very optimistically about relations between Poland and Europe. We saw that the academic institutions in Poland are moving forward with information management, information administration, helping decision-makers of tomorrow. And just now with Mr Hamelinck and Mr Borowiecki we see that steps, real steps are being taken to promote Polish business in Poland and abroad. I invite you all to tomorrow's session, Information Management, from 9.00 will 12.30 and the session for Access to Information from 14.00 till 18.00. Thank you all for your attention and please join us all for the reception for the official opening of BC-Net.

The languages for information in Europe: Projects of the CEC for the language industries

Vincente Parajon Collada
Deputy Director–General DG XIII

This paper was given at an open meeting of WERTID, the West European Round Table on Information and Documentation, held in Bordeaux on the 31 May 1991. The topic was The Languages for Information in the Europe of 1993. The meeting had been organized on behalf of WERTID by its French member ADBS, Aslib being the British member.

Mr Chairman, Ladies and Gentlemen. It is a great honour for me to address such a distinguished international audience in my capacity as Deputy Director-General of the Directorate General for Telecommunications, Information Industries and Innovation at the Commission of the European Communities.

The Commission of the European Communities is making great efforts to facilitate the creation and use of information technology in order to help to improve conditions necessary for a stronger Europe. In my presentation I will describe a number of projects currently underway at the European Commission in the area of language engineering, an area the Commission considers to be of crucial importance given its commitment to obtaining a true European market for information services.

Firstly I would like to describe the current situation in the European language industry. I will then go on to describe some ideas for the development of the language industry.

Many indicators show that we are entering a new information and communication age. The variety and complexity of information products and services which need to be managed present numerous problems. Thankfully, solutions are now feasible given the continuous progress of Information Technologies and Telecommunications. The impact of this new context on the whole sphere of world economic activity and resulting social progress is quite remarkable.

The Internal European Market beyond 1992 will bring with it an increasing need for cross-boarder communication in a multilingual and multicultural environment. The political objective is to preserve cultural and linguistic diversity and to encourage the economic and social cohesion necessary for an efficient internal market.

The move towards an information society involves three stages:

- firstly, the overcoming of physical and geographical frontiers by means of widespread use of electronic communications;
- secondly, the automatic processing of different "forms" of information, from numbers to text, voice and images;
- thirdly, the automatic processing of the content of the information.

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While electronic communication and automatic data handling are areas which have grown considerably in importance in recent years, the automatic processing of information's content using artificial intelligence and natural language processing techniques is just beginning. Nevertheless, processing information content is becoming vital to counter the ever-increasing flow of information. It is not enough to store, manipulate, retrieve and transmit information forms, we must also understand the meaning these forms convey if we want to treat information intelligently. In other words, having access to a larger amount of information does not necessarily imply being better informed, unless the content of the information can be managed effectively. This is the goal for which we are striving.

Studies carried out on behalf of the European Commission on the organizational conditions which influence the introduction and use of language engineering products often show a surprisingly limited market penetration for these types of "intelligent" applications.

Clearly, from a technical perspective the slow development of technologies and products for automatic language processing is often related to the intrinsic complexity of languages, the lack of adequate research and development programmes for language engineering, and the lack of an infrastructure of standardized language resources and tools.

Language is complex and multidimensional on several levels, from the morphosyntactic, to the lexico-semantic and the pragmatic. To cope with language as a human cognitive process an interdisciplinary approach is needed in which linguistics, logic, psychology, artificial intelligence and computer science all play a part. Together, these disciplines propose formal methods for modelling the complexity of language using computers.

The development of standardized language resources and tools will help in the task of mastering natural language complexity in two key ways; firstly, by providing a harmonized accumulation of linguistic knowledge (complete descriptions of natural languages, databases of text and voice, lexical elements and terms stored in large memories), and the reuse and transmission of this knowledge over communications networks, and secondly by avoiding duplication of effort and reducing the development costs of resources and tools.

Thanks to Machine Translation programmes including EUROTRA and SYSTRAN, and Research and Development programmes such as ESPRIT, the European Commission has contributed greatly to the definition of representational frameworks for linguistic information, and the advancement of tentative standards for the creation of resources and tools. Without doubt it has also contributed to extending the knowledge base required to achieve its language engineering goals.

Up to now, developments in the language engineering sector have mainly followed a university approach, with research funds provided by public authorities, and the end-products of research not being made available for commercial use. This tendency is progressively shifting towards an industry-lead strategy requiring specific language descriptions, common conceptual frameworks, and problem-driven guidelines that can be turned into products.

An ongoing study into activities and resources in the language engineering sector shows that in the European Community itself several thousand researchers are active in public and private laboratories, with an average of four to five researchers per laboratory.

The European Commission already co-funds 40% of the development activities in research laboratories. Industrial contracts, on the other hand, constitute 25% of the laboratories' financial income.

The potential of researchers and research programmes in the field of language engineering clearly exists. However, the conceptual frameworks permitting the integration of different techniques for language description and language resources and tools are currently under development. Computer science has moved on from "data-crunching" to the manipulation of both written and spoken texts, and image processing.

Technologies for massive data storage and retrieval, and automatic character recognition already exist. Telecommunications networks already allow for text, voice and image transmission. Nevertheless, some obstacles remain which prevent language engineering from providing solutions to the potential demand.

The Commission has launched a number of preparatory studies in order to gauge those factors which either enable or disable the development of the language engineering field. These studies will help to further define a strategic Community programme in this area.

From the perspective of the language industry demand side, detailed quantitative studies carried out in the twelve member states, covering an estimated population of forty-eight million white collar workers, show that around nine million man/years are dedicated to the writing process. Document creation in the native language represents almost half this time; more than two million European white collar workers write in a second language every day.

Results from these studies suggest, among other things, that the tasks of creating and manipulating written documents, and their classification and retrieval, are carried out by all types of white collar workers. These activities consume around 10% of the resources of white collar workers, representing an annual salary cost of five hundred billion ECUs in the European Community.

Language engineering products can make tasks of these types more efficient by providing solutions to specific document manipulation activities. Thus a variety of products can find a market niche on the condition that the demand stimulates their development. This potential demand will vary depending not only on language demography – for example the French language market is potentially larger than the Italian or Danish one –, but also on the actual economic value attached to the language. This may explain why more than half the language products available are designed for the processing of English.

In order to analyze the characteristics and the structure of the supply side, a variety of studies have been launched by Directorate-General XIII. We have already commissioned studies on the state-of-the-art of language engineering, on the main industrial, research and organizational factors in the field, and on the current research projects in Europe, the USA and Japan.

In addition, we have commissioned an inventory of available language products divided into several application types, from the simplest, for example writing tools performing basic linguistic functions, to more complex applications such as machine translation systems.

An analysis of the inventory shows that, disregarding large corporations interested in the development of language technology, the profile of the typical company involved in the language engineering field is that of a small organization with between five and ten specialists working on the development of a few language products, and aiming at small segments of the language industry market.

The total number of employees in this industrial context in the European Community can be tentatively estimated at around one thousand, of which more than half work for large companies.

As for the products themselves, most deal with restricted types of vocabulary and perform tasks with a low level of linguistic complexity, in which semantic and pragmatic issues are rarely addressed.

Given this overview of the supply and demand sides of the language engineering market, it is increasingly evident that a strategic Community programme is needed, in order to ensure a coherent and harmonious development of the language sector in Europe. This is apparent for two reasons: firstly, such a programme will enable optimal exploitation of the internal market without detriment to its economic and social cohesion, and secondly it will enable the European Community to preserve its multilingual and multicultural diversity.

Given this, Directorate-General XIII of the European Commission is preparing a strategic approach aimed at creating the basic infrastructure required for the development of the language industry, and aimed particularly at:

- removing the linguistic, technical, administrative and legal barriers which create an obstacle for information interchange;
- stimulating the continuous development of technologies for the automatic processing of natural languages and facilitating the synergy between both research and industry, and supply and demand;
- contributing to the creation of an infrastructure for public and standardized linguistic resources and tools which render the results interchangeable, reusable and cumulative, in order to minimize duplication of effort and reduce the development costs of resources and tools;
- reinforcing the European offer of products and services for the automatic processing of natural languages and the integration of these products and services within different application sectors;

These goals are currently pursued along the following lines:

- A series of planning studies, to which I referred earlier, have provided a comprehensive description of the language engineering domain.

- As a first step towards the development of the Community action programme the Commission will foster the development of an advanced communications network which is both open and widely accessible, and specializes in the interchange of text and voice data, and linguistic tools and information needed by research and industrial bodies. The IMPACT programme (Information Market Policy Actions), which aims to create an information services market in Europe, is already establishing the conditions for the development of this language network, as well as the corresponding databases containing information drafted in all languages of the European Community.

  The Commission will also see the possibility of encouraging the creation of a European infrastructure of pre-competitive public-domain language resources, which are large databases of standardized data (reference corpora for text and voice, electronic dictionaries for European languages, terminological and knowledge databases) and the tools required for their exploitation. Some Commission initiatives have already taken place. For example the ESPRIT projects ACQUILEX, MULTILEX and SAM are working in this direction, as does the Commission-supported feasibility study for the creation of a European network of text corpora.
- In order to build this infrastructure of language resources through a cooperative scheme it will be necessary to reach an agreement on possible standards in the language industry. These standards will improve conditions for the representation, storage, interchange and reuse of language data.

  In other words, there is a need for standards at several levels: standards for the interchange of lexical and terminological data, such as those proposed by the Text Encoding Initiative and partially funded by the European Commission, standards for the harmonized development of text and speech corpora, standards for the creation of electronic dictionaries, and so on. In this respect the EUROTRA follow-up studies are already suggesting a number of possible standards for language engineering, and the legal problems involved in standardization, including copyright issues, for example, derived from the creation and exploitation of lexical, terminological, text and voice databases are already being partially addressed.
- Directorate-General XIII's Multilingual Action Plan is directed at the development of a services sector for the language engineering field, and aims to synchronize the development of research and application projects with special attention given to the creation of language resources and the development of a language technology based on accepted standards.
- Last, but not least, in addition to promoting automatic language processing, the European Commission is making efforts to increase the linguistic competence of its citizens by means of programmes such as LINGUA.

Conclusion:

In my contribution to this conference I have tried to give you some insights into European Community action programmes aimed at stimulating the language engineering sector in Europe.

I have tried to explain that natural languages are very complex in terms of size, variation and possible linguistic combinations and that language engineering plays a crucial role in promoting the change from a language technology sector which up to now has been extremely research-oriented to one whose strategies and goals are lead from an industry perspective.

Substantial progress has been made in the past in the research domain. This progress should now enable the private sector to play its rightful role in defining strategies for the automatic processing of natural language.

The Commission of the European Community is convinced that with the participation of European universities and industry, Europe will be ready to face the challenge of the internal market after 1992 – a market which will present ever-increasing needs for communication in a multilingual and multicultural context.

The development of a standard test method for the wear resistance of library buckrams

Paul Green
Leeds University

Introduction

During the early 1980s, a serious problem arose with the buckram used to bind our journals and books. The problem was brought to light by our readers, who complained that they were unable to read the lettering on recently bound journals, in particular in the relatively dim lighting of the bookstacks. This problem appeared to be particularly acute with blue, orange and purple fabrics and in essence, the fabrics appeared to be extremely "fuzzy", to the extent that the blocked lettering had become almost completely obscured. Volumes bound prior to 1980 were, however, perfectly legible, despite their greater age and wear. It was thus clear that a serious problem had occurred with the quality of the library buckrams used on our journals. Furthermore, our binders confirmed that they had not changed suppliers, so the problem must lie with the manufacturers of this fabric, specified as a top grade library buckram.

Since my university studies had been in Textile Chemistry and Textile Physics, I decided to investigate this problem further and undertake a series of tests, prior to approaching the manufacturers. A simple wear test was done on a Martindale Abrader, rubbing the fabric against itself and examining samples at intervals for signs of wear (1). Wear tests were then conducted on a number of other manufacturers' buckrams and the results showed that the "fuzzy" buckrams wore out five times more quickly than the best of the other buckrams, and three times more quickly that the worst of the other buckrams. Examining the "fuzzy" buckrams at eye level against a bright light indicated that fibres were breaking through the surface, and this was confirmed on examination under a 20x magnification microscope or hand lens. The reasons for this were either insufficient resin being applied to the surface of the buckram, or a poor quality base fabric, or a combination of both.

Despite representations to the manufacturers and an assurance that the problem would be sorted out, we had seen only marginal improvements over the last few years. It was therefore decided to undertake an extensive trial this year on a wide range of library buckrams and to establish a standard wear test which buckrams must "pass" in future in order to be used on our bindings.

The following section describes the standard wear test, which has now been established.

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Standard test method for the wear resistance of library buckrams.

(1) Refer to the Appendix section of British Standard BS 3424: Part 24: (1990) entitled *Testing Coated Fabrics – Methods 27A and 27B. Methods for determination of abrasion resistance* for instructions on the assembly and maintenance of the Martindale Abrader.

(2) Use samples of buckram (the test fabric) as **both** the abrading and test fabric, ie use the buckram to rub against itself.

(3) The test should be carried out under Standard Temperature and Humidity conditions, ie 20 degrees Centigrade and 65% Relative Humidity – the test buckram should have been allowed to condition in this atmosphere for at least 24 hours prior to conducting the test.

(4) Load the rubbing heads of the Martindale Abrader at a standard load of 12 K.pa.

(5) Start the rubbing test and examine the buckram after 1000, 2000, and 3000 cycles.

Fabrics which have "passed" the test should show little visible sign of wear after 3000 cycles, on the large base sample. The point of using buckram to rub against itself is that this action is the closest to what is actually happening to bound volumes on the library shelves when they are being used. British Standard BS 3424 part 24 describes the use of various abradants (2), but in my opinion, these are not appropriate for testing library buckrams. Indeed earlier trials with some of these abradants wore the surface off the buckrams so quickly that they failed to demonstrate any difference between library buckrams. These differences only became apparent when the buckrams were rubbed against themselves.

Results of recent tests.

Using the standard test method described above, five different manufacturers' buckrams have now been tested, 3 British, 2 European and 1 American. The American fabric was by far the best, showing no sign at all of wear after 3000 rubs. Unfortunately, it was very thick and relatively inflexible, so that it was very difficult for craft hand binders to "turn it in"; this was not the case where binders were using case making machines, but there are very few binders in the UK who are using these.

Of the European buckrams, one passed the test (all samples were acrylic coated) and one just failed it (all these were nitrocellulose coated). Of the British buckrams, one manufacturer produced the worst (nitrocellulose coated) and this failed the test abysmally. However, this same manufacturer also produced some buckrams in his colour range which were acrylic coated and these were the best British ones. Another British manufacturer's buckrams failed to pass the test (all nitrocellulose coated), despite modifications. The third British manufacturer produced buckrams (nitrocellulose coated) which passed the test, but had still not been approved by our binders due to difficulties in application; this was being worked on and it was hoped that approval could soon be given.

Conclusion.

The standard wear test described above is relatively simple to undertake and will quickly confirm the wear characteristics of library buckrams. For librarians though, the main point to be watching out for is "hairy" or "dusty" looking volumes, as they are returned from binding. It is essential that librarians query such volumes and refuse to accept substandard buckram being applied to their bindings, otherwise enormous rebinding costs are likely to be necessary as the material wears out long before it should do (we are already experiencing buckrams which have completely failed on undergraduate textbooks which have been bound for less than five years).

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(1) Green, Paul R. Binding fabrics. *SCONUL Hints and Queries*, No. 4, March 1988, pp. 4-5.
(2) *British Standard BS 3424 – Testing Coated Fabrics.* Milton Keynes, British Standards Institution, 1973-1990.

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Methodologies and models for information management

Ewan Sutherland
Stirling University

What I want to do is to talk about some of the issues which arise from information management.

Now the first of those is to begin to address the question of where that fits in the organization. Who is it that's managing information, who is it that believes they should be doing that? And if you ask people what they are managing, it is very seldom you get an answer which says, 'I am managing information.' They will often answer that they are managing the technology – technology is very attractive, you have seen some of it next door. It's great to say, 'I have bought the newest, fastest Japanese or American piece of technology.'

Many people view themselves as managing information systems, systems which are providing transaction processing support for the organization; some people would view themselves as managing information, but not, I suspect, very many; some people – and this next item is a subject of some delicacy in Eastern Europe – some people manage telecommunications networks. I gathered from the questions yesterday that that may be a little way off. Other people view information systems or information management simply as another department. It's another function within the organization, and I mean by that that it is subject to the normal problems of organizational politics – do I get the money or does the production department get the money? Or does some other department get the money? Who is running the show?

Now what has made this area very interesting in the last 10 years has been the development of strategic interests, business strategy within the company. The business strategists are the people who decide that, no, we do not wish to go into the business of manufacturing one particular thing, we want to go into another area. You heard yesterday the speakers from Digital and from IBM explaining that they were making more money in services than in manufacturing. Those are the sorts of strategic decisions which say that there is no money, certainly no money today, to be made in manufacturing, so you make money in providing additional services.

So the strategists look at information systems, and they try to find ways to be more competitive. So they are looking at different areas of the company and they are saying, 'Can we make that a source of competitive advantage, can we beat somebody?' So there are people in Western Europe at this moment wondering how they can cut costs in the face of the cheap labour which is allegedly available in Eastern Europe. They are looking for ways of overcoming that. The business strategists have seen that they were spending more money on information technology and that it did not seem to be very well coupled – it was poorly linked to business strategy. They had this problem because they could not understand why they were spending more money on information

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technology, but all the reports they saw in the newspapers said information technology was becoming cheaper. Why was it that if the costs were falling the expenditure was going up? The answer was that it was not the hardware, but the humans that cost; it was the people around the computers that were causing the increase. One aspect of that is proliferation. The quickest way to cut your information systems is to stop people buying personal computers, particularly portable laptop computers. You may have seen next door little laptops which weigh no more than 3 kilos and have the processing power of a considerable mainframe of some years ago. How does one bring under control this immense proliferation of everybody deciding that it's my turn to have a go at computers today? There was also a feeling that information systems departments were very slow to respond. When you asked them to do something they might take one year or two years to do it and yet the business strategists needed to do something in a few days or at the most a few months.

At times information systems were a constraint, they made it impossible to do things. I'll give you a very simple example. In the UK there are what we call building societies, societies who lend me large sums of money to buy my house; allegedly I am a home owner, in fact I won't own my home until I retire because I have borrowed a very large sum of money over 25 years. Now two of those companies tried to merge to bring their activities together only to discover their computer systems were incompatible, they could not be linked, so they decided against the merger and found other partners.

On the other side it is not simply a matter of business strategists expressing a view. Information systems departments had an interest in this, because instead of responding to individual requests for new systems, they wanted to build an infrastructure, something which linked all the computer-based activities, all the information-based activities in the organization, and to do that it was necessary to come up with some way of linking the information activities to strategy. It was necessary to do that, to plan the new systems to be built and to plan the maintenance. One of the most disturbing things in the high cost of information systems is the maintenance – maintenance of old information systems, systems which had been there for 5, 10, 15 and in some cases 20 years. The information systems people had also developed formal methodologies, which required me to go to Chief Executives such as Roger (Bowes) and say, 'You have to tell me what your business strategy is. I need to know that.' To ask him questions such as, 'What is the strategy of your company so that I can tell which systems to build which might support that.'

There was a much more practical requirement. Traditionally the Western view of information technology has been cost benefit analysis. A Marxist will tell you that that is very simple to understand, it is the substitution of labour with capital investment. In other words, I computerize this and I get rid of 10% of the work-force. The problem was when you had done that once, you could not do it a second time. When you came to replace the computer equipment it was simply not possible, the people were not there to make redundant, to sack, and so what you did was instead of simply providing a cost benefit, you said, 'I will make the company more competitive by using an information system and somehow or other the company will outperform other companies.'

And finally there was the problem that the information systems department often found itself very late in discovering the strategic moves. It needed to be able to respond to the company suddenly announcing that it had been thinking about a joint venture in Poland for years. The information systems department are saying, 'but how do we make the telecoms link, how do we provide these facilities?' Not having been brought in at an early stage one can identify a number of stages in which one saw this strategic management. In some cases it is the avant garde; in some cases one genuinely recognizes that people are being innovative in their applications; in some cases it becomes fashion.

Chief executives have a bad habit of meeting with each other and discovering what other people are doing. As an academic I joke with my students about new ideas, ideas which chief executives pick up because their plane is delayed at the airport for half an hour. They go into the bookshop and buy the latest book which tells you how to improve your company and they read it on the plane. Those sorts of companies are following fashion. Inevitably there are the fashion victims, the people we see who are wearing individual pieces of fashion but, which seen as a whole, look so ghastly you have to take them aside and explain to them they have made a terrible mistake. By the time it reaches the level of the bandwagon rolling along, of everyone jumping on, of everyone saying, 'I am using information technology for competitive advantage or information for competitive advantage', it is too late, the competitive advantage is not there. I will come back to copying in a moment.

So what one finds is a very complex set of relationships. Relationships between business strategy, this idea of a mission, a vision statement, for the company which says, 'I am going to be the largest motor manufacturer in Europe', or that, 'I am going to have a 25% share of the world market', or whatever.

It is easy to change a business strategy – you get the chief executive to sign a new piece of paper and it goes out. That doesn't mean to say it will be successful. It is not particularly difficult to change the information technology. It is, however, hideously expensive; the cost of information technology and information systems is frighteningly high. The bit which is most difficult to change is the organization.

What would concern me in my visits to many parts of the countries of the former Comecon is that there has been very little, if any, experience in adapting organizations to using information technology. What becomes important in looking at the use of information, of information systems, is the ability to adapt the organization, to change the organization. The organization is a very slow thing to change if you think of simple things. How do I take an organization and make it more friendly to the customers; how do I get people to smile at the customers; how do I get someone not to stand behind a desk for five minutes talking with a friend until they finally decide, yes, the person has stood there long enough, I will talk to them; how do I get that attitude and shake that attitude out of them? If one thinks of information technology a lot of those applications involve organizational change. Those relationships are very complicated.

One of the problems we have in strategic applications is that we rely on a relatively small number of what can best be described as cliches. Most people in the West have heard the cliches so often that they believe they understand them. In my experience they don't. Nonetheless they will, in response to these names, quite happily tell you that they understand the significance of them. Let me take only the first example on my list, the American Airlines' system Sabre.

There is a delightful interview on video with the head of an American airline, I should say the former head of a former American airline, in which he explains that he could not understand why Bob Crandell, the Chief Executive of American Airlines, was talking about a hi-technology airline – he thought he was flying the same planes as Crandell. There was no difference. He then describes how his business was vaporized in a nanosecond.

His business was wiped out, not by faster planes, not by cleverer aircraft technology, but by using information systems to identify passengers, to offer special discounts to ensure that when you came there would always be a seat, to ensure that as much information was gathered about you and your flying patterns as was humanly possible, and that as a result the company could maximize the fare that was being paid. They could ensure not simply that there would be a smooth transactioning system, it was not *just* paying for transaction processing — it was analysing the information; it was identifying which routes people flew; it was identifying how many first class passengers there were going to be; how many seats were needed to sell to students and to the poor in order to fill up the spaces to get some income on it. A very complicated sort of analysis, but it is doing those sorts of things which help – the problem is cliches are not very helpful.

When one talks about strategic applications of information, what are they? One part is in identifying a technology strategy, — how do I link myself with the vendors?

You have seen the various computer companies trying to sell equipment – how do I maintain that relationship. How do I make sure that I am using the most cost-effective technology, the most up-to-date technology? How do I make sure that I am at an early stage of using the innovative applications and that they are not selling me old-fashioned technology at high prices?

One of the keys to that is the use of open systems. There is then the question of changing the business, changing the links to customers, changing the links to suppliers and providing customer service. Let me give you an example which I always like very much, the example of the Otus Elevator Company. The traditional way Otus operated was that when your elevator didn't work you phoned the regional sales office. Otus changed that and did away with regional sales offices. At first sight that sounds very strange, it sounds as if it's moving away from customer service, but the attraction was that it allowed them to gather information from all over the world, global information about when lifts broke down, why they broke down, who repaired them. They were able to analyse what went wrong, able to spot faulty design, faulty components and best of all, they could identify those mechanics who could repair elevators successfully and those who could not. They then went on to develop a technological application which was to get the elevator to phone home when it was about to be inoperative, so the elevator had some sophisticated electronics that allowed it to dial Otus and say, 'please come and fix me I am about to break down.' The intention was very simple, it was saying to the customer, 'You will sign a contract with Otus and you will never have to bother with us again, because we can identify the fault, we will make sure there are no call outs.'

This is all part of trying to think of clever ways to use information technology, to link to customers and to suppliers and to provide services that one can charge people money for, and in that same way one sees this idea of analysis of information. Traditionally cheques, inland revenue returns, internal revenue service returns, tax returns, and all sorts of other things were processed by computer. Where it becomes interesting is where one no longer processes them as the goal. But one analyses that goal, one analyses the information to identify groups of customers, groups of customers who one can then target products to. These groups of customers can be very very small, but because of the new economies of scale and scope using information technology, it becomes possible to target people individually. Instead of doing mail shots to everybody, instead of putting leaflets into every household in Warsaw, you identify the group of customers that you want and you can do that from your existing customer information. So you are no longer processing transactions simply for the cost benefits, you are doing it in order to identify lifestyles; to identify who is buying particular products or particular groups of products; who it is that we should be sending specific mail shots to; or to provide a new type of credit card; or some other new sort of system to people.

Finally, it is also possible to use information technology to support the process of developing a strategy, in the form of executive information systems. This simplistic explanation of an executive information system is for those of you who have seen the Star Trek television series and films. It effectively says that in the old days a British board room for chief executives would look as if it had wood panelling such as we have here. Now you remove that and you put in computer screens with beautiful colour graphics. It becomes possible to use some databases to determine whether your strategy will be successful, using some sophisticated modelling. It is also possible to use video conferencing to avoid having to be there in person.

One should, however, issue a cautionary word. The warning which goes with information technology and strategic advantage is that it does not matter how you think you have got strategic advantage – it is not sustainable. Somebody somewhere will overcome your competitive advantage and in the case of information technology and of information those stories are in the press. I will go back to my office on Tuesday morning and there will be a large pile of magazines and journals and newspapers with new examples, more interesting examples that I should know about. The suppliers themselves, in order to sell their equipment, will tell you of other strategic applications in other companies.

There are courses that I teach both at my university and for the UK subsidiary of a Japanese computer maker. We are running courses, giving these examples. Consultants go from company to company giving the same examples and finally the staff themselves move between them. So the general rule that competitive advantage cannot be sustained applies very specifically to information technology. If anything it goes faster in information technology.

The question then is how do I use, how do I achieve, advantage in information technology, in information, and the answer is that it is not through technological innovation, it is not through smart technology, it is instead through *smart people* . It is identifying where those sources of innovation are. Have I got people in my organization who have come up with a very clever use of information technology? If they have that new application, can I bring it to the market-place; can I be successful; have I got someone somewhere sitting on very interesting sources of information which nobody has bothered to analyse? If I give an example of my own organization, the University of Stirling, it has 10 years of records on magnetic tape which have never been analysed. These records contain all the applications of students to the university. Applications in universities in the UK are competitive and I am, with one of my colleagues, spending the rest of the summer analysing that data and we expect that information to be of considerable value. So where are those things, not technical innovations, but very clever innovations?

Now when one thinks of going beyond the level of example, of analogy – which is very difficult because people may not understand the analogy and because it gives few clues as to how to apply it – we come to levels of brainstorming, of awareness raising, awareness raising such as today. We can then go beyond that, we can begin to identify opportunities. We can say that you should be looking at the links to suppliers, you should be asking what clever things can you do by using electronic links to suppliers, not electronic purely for sending invoices, but to share design information, to allow me to look at the various components that you produce and decide which ones I want. There is a contract currently signed between General Motors and Borg Warner which effectively allows the computers to negotiate the contracts. It negotiates the delivery – the prices are fixed beforehand, but the computer decides on the quantity and the delivery dates; it's doing those sorts of things which become very interesting. The problems start when you try to become rigorous and formal. You can't be because what much of this is about is exploring new data and exploring new applications. Where we can use rigour and formality is in building the information systems.

If the last ten years have told us anything about building information systems, it's that we are beginning to get better at it, that we are really now quite good in the systems development cycle; we can manage the overall planning, we can manage quality much better than in the past. Project management skills have finally found a way into information systems. The investigation procedures have been formalized, structured methodologies have been developed, analysis and design is very good, and there are even formal methodologies for implementation. So we can build information systems and we can build them with a great deal of reliability to the extent that one now has a new discipline, the discipline of information engineering.

Information engineering brings together structured methodologies for programming, for analysis and design, but it stops short of much of what I have been talking about. It stops short of the level of information analysis, and the reason for that is that this is a completely new area. No-one has been taught how to analyse datasets which can be eight or ten megabytes and in the case of, for example, a large chain of retail outlets, they can generate vast quantities of data, measured in gigabytes. If you consider that for every item in a supermarket with a bar code on it there are nine data items held for that, and you are gathering that for every item, for every customer, in every store in the UK. You are generating a truly enormous amount of data, but when you succeed in that, you can optimize the product range you are carrying, you can test out new products. So if you are a UK food retailer and somebody comes to you from Poland and has this wonderful new product you can take small quantities of it, put it in a supermarket and within hours you know whether it is selling or not. And so it becomes very very easy to identify where to put things in the store.

The other area where we have seen that there has been a dramatic rise in information analysis, is what are called geographical information systems. It is already possible to purchase information from the UK census, taken a few weeks ago, and it becomes possible from that to identify various things. In my case all you need to know is that my postcode is FK9 4TQ and that information will tell you that I live in an area of large, mainly detached stone-built houses from the last century, where people own large Volvos and other expensive cars, and you can then target that area. So it is this ability to identify not only your transaction patterns but your geodemography, which is where the people are.

My final point is that in many cases these sorts of things are happening, not in relation to where one has found information science in the past, ie in libraries, but in areas which involve people in information systems, in business strategy. What can clearly be seen is a growth of analysis of information rather than what has been seen in the past as information processing and this will continue. It will go on and advance in many ways as we look at interesting applications in providing competitive advantage in beating customers because the truth is that low labour costs don't matter because the technology has overcome that. What becomes interesting is providing high levels of quality service to relatively small groups of people anywhere in the world.

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The corporate information management function

F Woody Horton
Information Consultant

I am very happy to be back in Poland again after a 3 year absence. I see a great many changes and I am happy to tell you that I see them all as constructive things that are happening. Speaking from my side of the ocean my country wishes you very well in your effort to move forward to becoming a part of the full EEC. I am sure you will reach that goal eventually and hopefully sooner than later. One of your speakers yesterday mentioned tourism and he put it in a "maybe" kind of context. From my standpoint there are hundreds of thousands of Americans who would like to be over here in your beautiful country spending money.

My task this morning was to talk about the corporate information management function, but I would like to take a step backwards and talk in a slightly more fundamental way about an even broader topic, and that is — what is information management? What is this notion that we are coming to call managing information as a corporate resource? Where does it come from and what does it mean? Many people think that it's nothing more than a metaphor, a cliche, and that we really shouldn't take it too seriously; all it really does is to give a new buzz word that we can all rally around and march to and then we can go away and be happy and we don't have to worry about it tomorrow morning. I'd like to argue in the brief 30 minutes that I have here this morning that managing information as a resource is far more than a metaphor. Indeed I think it can be taken quite literally and I really do believe that in the end, all of these cliches that we talk about — using information for strategic competitive advantage, using information to find new markets, to produce new products — really comes back down in the end to our ability to transform what could be a metaphor into a reality.

Let me begin by taking the position that there was a time not too long ago, 10-15 years ago, when the prevailing common wisdom was that every man was his own information manager and that there was very little that anybody else could do to help plan and to manage and control the information needed. But I suggest that that has now changed and because of things like the information explosion, because of the proliferation of modern information technologies, computers, telecommunication networks, office automation, CD-ROM and new techniques for searching and accessing and retrieving that information, eg. hypertext, we are now faced with a situation where indeed we have too much data and information and knowledge that we can't use. How is it possible that we can have too much unnecessary information that we can't use, but at the same time we don't have the information that we do need? At the heart of that paradox is – why we need information management.

It used to be that when we thought of resources we thought of men, money and materials, capital and labour and we did not give much thought to information because

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of the reason that I mentioned earlier, that everybody was expected to be his own information manager and if you didn't learn how to find information and use it when you were in school or in your job, then thats tough, nobody else would be able to help you. Now we've concluded that just as there must have been a day 20-30 years ago when we didn't have a co-ordinated personnel function and we didn't have a co-ordinated financial function. Now we have reached the point where we have realized that probably the heart of our problem is that we don't have a co-ordinated information management function. In short, imagine where we would be today if in the personnel area we had one little group of people responsible for recruitment, another little group responsible for selection, another little group responsible for assignment, still others responsible for promotion and training and so forth, and none of these functions or sub-functions were brought together, their tasks and activities uncoordinated. It would be chaos. We all know that to deal with that problem we have had to create a single focal locus on the organizational chart called the personnel office. We charge some individual with the responsibility for co-ordinating all aspects of the human resources management function.

To pick the other obvious analogy, imagine where we would be in the financial area if we had one little group of people worrying about cash accounts payable and accounts receivable, another little group responsible for long range investments, somebody else dealing with financial systems, general ledger accounts and so forth and so on. Once again we would have chaos if we didn't have a single focal locus on the organizational chart and if we didn't charge one senior official with the overall responsibility of being held accountable for managing the total financial resource of the enterprise; I think the analogy now stands in the case of information.

We have reached a point where we have technologies all over the place; we have a splintering and compartmentalized situation when it comes to information. People have it in their bottom drawers, it's in the libraries, in the technical libraries, in the information centres, in the archives, it's all over the organizational landscape. Have you ever wondered why there is no single central place to which you can walk or call on the telephone, or connect with electronically, to find information about information that your enterprise collects from external sources or produces internally and stores and uses? There is no such single central authoritative network or system where you can go. There is a little bit in the library and if you happen to know that the information that you are seeking is in literary form then you can go to the library and the librarian can help you. If you suspect that it's in a database, either external or internal you might go to the information systems department. In the States we call it MIS/DP – Management Information Systems/Data Processing – and you can ask the computer centre chief to try and search it in the databases, or perhaps its a piece of paper in the administrative files, a long forgotten memo. Most of us don't know whether the information we are seeking is necessarily internally or externally located and we don't necessarily know whether its in machine-readable form or whether its in the form of a book or a government report. To use another buzz word of current times, we should not have to know that as end-users, it's up to the people who supply and manage the information and who serve us as end-users, to make invisible or transparent the mechanism or machinery. All we should be able to do is to be able to find it when we need it and have it presented to us at the right time in the right form and in the right place.

So with those few introductory remarks let me show you now a few transparencies. Again my objective is to try and share with you what I think the information management concept is all about. This is intended to convey the notion that we have too much information that we cannot use. We are all faced with a glut of having more of it than we can possibly use and yet we are still not getting what we *do* need delivered to us at the right time in the right place in the right format, including the right medium.

Although we tend to use them as synonyms, when one tries to talk about the concept of information management it is essential to make a conceptual distinction between assets and resources. So I would assert this morning for our purposes in my little discussion, that we will regard assets as the *content* of the information, be it in a book, in a databank, in a document, in a technical report, or a CD-ROM disc. So the asset is the value we get out of using the information.

On the other side are the resources. That is to say all of the hardware, the software, the systems, the people, the costs, the air conditioning, the insurance, all of the expenses that go into establishing and operating information resource entities whatever they may be – libraries, computer centres, government agencies, statistical offices, and so forth.

There is a kind of a business equation – on the one hand we are trying to maximize the value we receive out of using and applying information for our purposes and ends, whatever they may be, and at the same time we are trying to minimize the costs in acquiring and using all of the hardware and the systems and the people that go into operating those information resources. I would not go so far as to say this could ever be made a precise mathematical equation, but I think it is useful in trying to understand the information management idea; to bear in mind that if we have a situation on our hands where, as Ewan again alluded to, we are wondering why our total information handling costs are going up and still we are not getting what we need. We are back with this equation. We have ended up with a situation where we haven't taken steps to control and manage this equation. We have no way of evaluating the asset side to see whether the values and the benefits that we expect from acquiring and using the information are exceeding the costs and burdens on the other side that go into acquiring, and putting in place, and operating, and using it.

I said earlier that traditionally organizational resources come in three basic concepts: human resources or personnel, capital and material and now, to take a leaf out of Roger's speech, we have a fourth resource, we have information and we are adding it to this list. So we not only have human and financial and material or physical, but we also now have information resources, and I repeat this is not a metaphorical thing we are talking about. I intend that we should take it quite literally and to support that I would like to suggest to you that information, while it is different from other resources, is also quite similar. For example, it shares with these resources the same objectives. Whether we are talking about the people we need in an organization and the skills and competencies they should have; whether we are talking about the financial resources we need for investment and operating expenses; whether we are talking about plant and equipment and material; and whether we are talking about information; the objectives are the same for all of these things. Which is to say:

1. We want to maximize the value we get out of using them;
2. We want to minimize the costs involved in acquiring them and using them;
3. We have to fix accountability for their use — that is a big hole in the current way of looking at information management in most organizations. We simply do not hold anyone accountable in the same sense we do with the other resources;
4. We have to ensure a continuous supply of this resource.

If you think about it for a moment I argue that those four objectives are just as applicable to human, financial and physical resources and indeed even natural resources. It is just as important for clean air and water, or forests and clean rivers and lakes, as it is to information. So I offer this list of objectives in support of my thesis that information should be considered just in the same list as the other resources.

Another common misunderstanding in information discussions about the concept is that information resources management is a technical issue; it is not. We are not here talking about online database searching or library card cataloguing. Nor are we talking about the design and development of information systems. We are talking about managing information in a business sense. That is to say that we want to keep track of its values and we want to keep track of its costs and we want to make some assessment as to whether or not that equation is roughly in balance.

So managing information is a business issue, it is not a technical issue. It often gets confused with it as we tend to think of the concept in metaphorical terms and I find that my librarian and information systems brethren tend to dismiss it after a certain point and say, 'Well its useful to think and to use some of the terminology that comes from that emerging field, but in fact we really don't believe it in any literal sense.

What are the information resources we are talking about? They've already been mentioned yesterday, and today we are talking about all of it not just some of it. To me perhaps the most exiting aspect of the information management idea is that at long last we have within our grasp the ability to deal with all the information, not just a part of it. We can deal with the external and the internal, we can deal with the manual and the automated, we are not just dealing with information systems, but we are also dealing with information sources and with information services. I would argue that the efforts of a translator, a graphic arts department or a technical editor are just as important as information services, as are the efforts of a librarian or an information systems designer because the common ingredient in all of these things is that we are taking data or information in a semi-finished state, if you will, and we are adding value to it by virtue of our skills as information professionals. We are transforming those raw or semi-finished data goods into finished goods and services in much the same way as we do, or did, in the industrial world. Where we are taking raw materials and we are transforming them into finished or semi-finished goods, we are doing the same thing in the information area and we can talk about it in the same way. So we are talking about all these things on this list — computers; certainly all the technologies, regardless of the media; we are talking about data documents and literature and we are talking about external and internal.

I am always a bit surprised when I come to a conference that is dominated by people from the information provider field — publishers, online database suppliers — because you tend to get the impression when you hear the talks that all we need worry about is these external suppliers providing all their wonderful products and services to the enterprise and then we walk away from it. Well, those of you who have ever been in an organization will know that that is just the beginning of the problem. You have to take those externally acquired products and services — who gets them where they should go — and they have to be melted with the internal products and services which are very often larger in number and more complex than the external. So the corporate information manager and the corporate information management department must combine or melt together the externally acquired information goods and services with the internally produced. They have to be co-ordinated together, they cannot be viewed as separate worlds, separate channels, never to come together. One of the great things about Windows, the new software technology, is that one can bring up an externally acquired database in one window and as internally produced database in another window and look at them together and produce a third window with the two sets of data merged together.

Beside the technology explosion and the information content explosion, if I can call it that, too many magazines, too many journals, too many this and that and the other thing and other reasons, we are brought to this point where we are being forced to consider this new paradigm of information resources management because of the internal inefficiencies of handling information. These two view graphs in a cartoon-like fashion are intended to show a situation which I daresay many, if not most, of you are all too familiar with. It is for these reasons that we need a single central authoritative system, a database of databases.

Now let me say that in talking that way I need to immediately say that I am not talking about trying to bring together into one huge central databank all of the information in the company and put it under the control of some information tsar. Don't ever let anybody tell you, but its a common misunderstanding and its often thrown up by critics of the idea because they would like you to think that this is a sneaky way, under the guise of a modern management information phrase, to give power to a group of people who are going to abuse their authority. There *is* a danger, and undoubtedly some of our Chief Information Officers will abuse the authority that is given to them. My answer to that, however, is that we should not discard this whole concept just because we may find a few bad apples in the barrel. We have always had unscrupulous controllers who have embezzled the funds and run off to Rio, we don't indite the whole controller concept because of those few bad apples, we throw the scoundrels out when we find them. We have always had some unscrupulous personnel managers who abuse the trust that they are given by the CE by following nepotism procedures, by putting their favourite, totally unqualified, nephew or niece into a position, but we don't condemn the entire personnel management idea just because of a few bad apples in the personnel management barrel. So I would argue here that if we find an unscrupulous Chief Information Officer or senior information manager who abuses his or her authority by trying to use that position for personal gain then I should say we throw the scoundrel out just as we did with the controller and the nepotism example I just gave you. I need to dispel another notion. In talking about managing information as a resource it is sometimes feared that the ownership or the information is somehow going to be centralized or transferred into the department of this information manager – that is patently false. The only information that the Chief Information Officer owns might arguably be what is technically called meta-information of the information about information. If the Chief Information Officer operates a central information locator service of some kind they may have an information about information or a meta-information system, but the marketing database for example continues to reside in the marketing department, the personnel information system continues to reside in the personnel department. So there is nothing in this concept that should lead us to think for one moment that we are changing the balance of power, that is to say the ownership of information in the systems, services and sources that are currently operated. They will continue to reside where they have always resided and the line and staff operating managers who were always in charge of them will continue to be in charge of them under the information management concept. All we are doing here is putting in place a hopefully small, lean staff of corporate information management professionals whom we are charging with resource management responsibilities. We are not shifting or altering in any way the balance of power within the organization.

Now what does this department do? In the interests of saving some time let me jump ahead. They are responsible for corporate information management policies. Corporate information management policies are not the same as corporate information policies. By putting the word management in there, we are now quite deliberately calling attention to what steps we are going to take to plan, to budget, to manage, and control information. We might have a corporate information policy at the nations state level, Poland for example. One of its Ministries might issue a corporate information type policy that said that it is the policy of the Polish government to ensure that its people are informed of the processes of how government does its business or another one that might deal with privacy. It might say information on its citizens should not be held by the government on its record keeping systems without the ability of Polish citizens to periodically examine that information to make sure that it is complete, correct and up to date. When we come to management policies, however, we are talking about things like this enterprise views all of its information as an asset which has both value and costs and will take steps to ensure that the values exceed the costs; so it's a different kind of a focus. We are also talking about things like the lifecycle management of information. That is to say, we will manage information from birth to death, from its creation throughout its use, storage, retention, re-use, communication and up to disposition and archiving. I won't go through the whole list, but let me just summarize the point by saying the role of this staff is to serve in a fiduciary or custodial role in the name of the CE Officer to ensure that all of the information, sources, services and systems used in the enterprise are used efficiently and effectively and economically. So the Chief Information Officer like the Controller and like the Chief Personnel Officer acts as a lieutenant in the name of the CE Officer, being a devils advocate where necessary, to challenge information needs. That sometimes does not go over very well because people like to think that they don't need anybody looking over their shoulder to help them decide what information they need. I respectfully suggest to you, however, that I think we have reached a point where we do need help, and we need help badly from information professionals who can help us articulate our information requirements more completely and more carefully. I use the word respectfully because I know a lot of us feel that, we are the only ones who know what information we need. At a certain level that's true, but at the same time when you are talking about the corporate environment, the situation becomes much more complex than that, and we do need the help from librarians and from information systems professionals in deciding about alternative hardware, software, systems and networks. We need, frankly, all the help we can get, so I for one am delighted that here comes an opportunity where there is a person, the Chief Information Officer and a staff of trained people, who can help me as a user articulate my needs and plan and manage them better; to help me do benefit cost studies; to help me do feasibility studies; to do all kinds of benchmarking and economic analysis because of the tremendous number of alternative sources of supply that we are now faced with.

In the same spirit of talking about information holistically or universally we are indeed talking about the staff co-ordinating all of these functions and activities, not just one of them, but all of them. So we have on the list things like advertising, archiving, collecting statistics, computing database management forms, management library services, mail and courier. You know the mail and courier services are just as important in some ways as our contents services just because they are devoid of content, as it were. That is when one uses a copying machine or if one gives a letter to a postman for delivery they don't have to read the letter to deliver it. But it is just as important to manage the content-free or the carrier information services as it is to manage the things like books, government reports and management information systems. So they are all included in the same spirit of a universal definition.

Here is a little list of other roles for the information management staff to prepare a strategic information plan that links the business plan with the information plan. How many of you have seen a plan that links the business goals with the information requirements? We are now learning how to do that, to really prepare a good strategic information plan, to prepare an information budget. How many of you have seen a table or a matrix that shows you where your information dollars are being spent in terms of departments, in terms of media, in terms of individual services such as the library, information systems department, information centres. Again, we are just learning how to prepare information budgets, yet how can we expect the top management, the executive level, to understand where our dollars are going if we don't have an information budget format? It's not all that difficult to prepare. They should also serve in a secretariat role to support a government-wide committee of some kind that takes up standards, guidelines, training issues and so forth. If you don't have an organizational-wide information council or committee of some kind I strongly urge that you need one. You can start modestly, but somewhere along the line I think you are going to be forced to create one and this small core information management staff has a vital role to play in supporting that.

I've gone on a little beyond my time here so I'll try to summarize by simply saying that managing information is a resource. It is indeed more than a metaphor, it is to be taken quite literally, and it borrows many, if not most, of the same methodologies and techniques that have traditionally been used in the other resource management areas, and customizes them or tailors them to its own needs, bearing in mind that there are some similarities between information and other resources. I don't mean to minimize that, but I would argue that there are more commonalities than there are differences, and because there are more commonalities we can now make come alive this notion of managing information as a corporate resource where the corporation owns the information for the most part. It's up to us to ensure that it is used wisely and cost effectively and that we don't end up with a continuation of a situation wondering why we are spending all this money for systems and networks and technologies which are only marginally used. We don't know who's using what information for what purpose and with what results and who could and should be using what information. You see, those are information management challenges. Who is using what information for what purpose and with what results, and who isn't using it with what negative effects; who could be using it, and who should be using it? Those are management questions.

Managing corporate records

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I should like to start by thanking the organizers of this conference for the chance to give what I suspect may be one of the first papers concerned with this particular branch of information management ever given to a Polish audience.

I shall concentrate in this paper on some of the more practical concerns and operations of records management. If I could briefly summarize the paper, it will attempt first to look at what elements might be involved in managing corporate records, including aims and programmes. Secondly, it will highlight some of the key issues involved for anyone responsible for corporate records, and thirdly it will suggest some of the major benefits to be gained from managing records properly.

I should perhaps confess to some apprehension at speaking here in Poland for the first time. It may be that some of my audience will not be so familiar with this branch of information management as we are in the English speaking world. This may lead to some difficulty in finding direct equivalent translations for some terms I use, but I will do my best to make things clear.

Now the title of this paper is *Managing corporate records*, and I should now like to look at that in a bit more detail and describe just what is involved in this. First of all, a few definitions.

A record is any kind of recorded information *regardless* of medium. Now that qualifying remark on medium is important because we are not just dealing with paper, even though 95% of recorded information in the UK is still held on paper. Technologically records management deals with everything from clay tablets to optical discs. Corporate records document the activities of the organization that creates and receives them and have often been described as holding the corporate memory of that organization. They include everything from invoices to a directive from the chief executive, from a form detailing staff holidays to a policy statement from the Head of Personnel. For a third definition I would like to look at records management itself and this is really the discipline of applying scientific and specific techniques to control those sources of information which arise internally within an organization as a result of its own activity. It is therefore distinct from librarianship which is primarily concerned with external sources of information.

It is essential to understand that records management is concerned with the entire lifecycle of records as they progress through the various stages of the system. First of all records are created or received. They are then used by the organization and may then either be destroyed if they are ephemeral or stored if they seem to be of longer term value. They may also be converted to a different medium — for instance you may transfer from paper to microfilm in order to reduce the volume or because high rates of use may damage the paper.

Once in storage, whether a simple filing system or a records centre for semi-active

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records, a decision will have to be made on whether to retain them permanently (in which case they would go to the archives) or whether to destroy them.

This progression of a record from creation to final disposal – and as I have indicated this could mean either destruction or permanent preservation – involves three functional phases. First of all active records which are regularly used for the day-to-day business of an organization and are usually maintained in their place of origin or receipt. Secondly, semi-active records which are so infrequently needed for day-to-day business that they can be transferred to a separate store, known usually as a records centre; it is at this stage that the decision on their final disposition, known as appraisal, will be taken. Thirdly, archives, which are records preserved by the organization because of their permanent value.

Now at this point I would like to say something about the actual need for good records management. I have no doubt that all organizations, from one-man operations up to multinational businesses or the central department of government, all have this need because all of them generate evidence of the activities they perform in the form of records. This first problem in managing those records is to recognize that there is a need to manage them. The fact that records management is clearly sensible and beneficial and effective and even cost efficient, is not always immediately apparent to the organization itself and those who control it. I am reminded of a remark by an American records manager who said that records management is rather like lift maintenance for the people who work in an organization. You travel up and down in the lift many times each day and as you do so you just assume that the lift is being properly maintained even thought you never see it being done, but if the lift suddenly stops between two floors you feel upset — you expect it to work without problems. It is almost like an act of faith now. Many organizations and their staff, unfortunately, regard records management in the same way as they regard lift maintenance — they take it for granted. They know its happening because records are all around and occasionally they might even see one that they need.

Fortunately there are ways of persuading organizations that good records management is something worth aiming for. One way is to make clear the aims of good records management and that is what I would like to talk about. Now there are two ways of looking at these aims: one is from the top down, a strategic perspective; the other is from the bottom up, a procedural perspective. From the point of view of strategy records management should aim, firstly, to provide a clear analysis of all the internally generated information resources in the organization, and secondly, to link up with all the other major information areas, principally libraries, in order to help map out a coherent information strategy. Now from the point of view of procedures, records management should aim, firstly, to achieve effective documentation of the organization's policies and transactions, and secondly to make that documentation available to those who need it as efficiently as possible. These procedures are often summed up in the well-known phrase 'getting the right record to the right person at the right time and at the right cost.'

Now this overall procedural aim implies a series of related assumptions. First the act of creating records needs to be bought within the ambit of managing records. This has already happened in many organizations, in the US especially, and means broadly that you introduce controls which limit, if not entirely eliminate, the creation of unnecessary records. Secondly the records in the organization need to be maintained and made available both effectively and efficiently. Thirdly, records which have served their purpose and outlived their value should be destroyed immediately. And lastly records for long term or permanent retention are selected both quickly and decisively.

Once we are clear about the aims of records management we need to consider the ways in which we achieve those aims, in other words, how to implement a records management policy. There are a whole range of records management programmes which cover the control of records at all stages of their lifecycle, from creation to destruction, but not all of them will be needed in any one organization at any one time. The selection of appropriate programmes will derive from the analysis of organizational aims and information needs which is part of the creation of an information strategy. I will come back to this a little bit later. The programmes themselves, as I have said, cover every aspect of records management procedure and policy. I would like to concentrate now on what I see as the most important programmes both in terms of developing the overall records management system and of general application for all organizations.

Now the first programme I will consider is what is called the records survey. This involves, as the name suggests, a comprehensive view of all the records generated by the organization. It is like a physical stocktaking of records which gives you an accurate picture of the total volume of records stored by the organization, where they are stored, how they are arranged, what form of media they are in, their status as records, i.e. whether they are drafts of final versions, master copies or duplicates. The survey will also reveal the rate at which the records accumulate and the frequency with which they are used. As you can see this gives a fairly good breakdown of most, if not all, of the information you may need in order to develop further records management programmes. The items of information I have mentioned can either be reduced or increased according to the needs of the situation.

With this information at your fingertips you are now in a position to move to the next programme, appraisal. As I mentioned appraisal is the process of analysis of the surveyed data and it enables you to make decisions about how long each separate organizational group of records, usually known as a records series, should be retained. These decisions should be agreed with the creators of the records and also recorded in some form. This record is known as a retention schedule.

The third programme I would like to mention involves the retrieval of information. Unless you have a co-ordinated system which includes adequate classification and indexing systems the process of retrieval will always be laborious and frustrating. The whole question of shared access to records of common interest, whether paper or electronic, can only be resolved by a structure mechanism. A lot has been written recently about automated indexes to records and how they speed up the retrieval process. It is useful to remember, however, that by automating you also lose some of the human element, the ability to explain meaning in a precise context, as well as the details of the particular functional perspective that informed the creation of the index itself.

The last programme in a records management system that I will look at in any detail I will call the 'evaluation of media'. This enables you to choose which medium your records should be held in. This question has of course become more critical with the increasing use of computers in information handling. Interestingly the increase in automation has been matched by a massive increase in the volume of paperwork. This is partly because a lot of the most effective electronic processing devices, like photocopiers, desktop publishers and fax machines all seem designed to speed up the process of generating paper records. It is also true that paper has proved generally to be more acceptable than online facilities. This is for various reasons including, of course, papers familiarity, its flexibility, its portability and the fact that paper records are less easily forged than electronic records. There are of course advantages to electronic data. It is easily updatable and rapidly manipulated, its design capabilities are enormous and its transmission speed over long distances reduces costs and improves information handling, but there are clear disadvantages too. Browsing is difficult with electronic data, validation is almost impossible, durability is poor and compatibility between hardware suppliers and different generations of the same hardware is low. Overall I think it is fair to say that electronic data processing is still suited to high volume records which need regular updating and scanning, but not for the long term retention of historical data nor for records needing clear and unequivocal validation or authorization.

Well I have given a brief indication of four of the major programmes necessary for establishing any comprehensive system of managing corporate records. Other programmes would clearly need to address such matters as the storage of records and their security, the arrangement and management of archives and records centres and the whole question of vital records.

I would now like to move onto considering some of the key issues which underpin the management of corporate records, the first issue is the status of records and their connection with information generally. It's a major problem at the moment that the approach to information management is piecemeal. The objective must be the management of information as an asset to the organization rather than as a liability. Records management is one of several disciplines involved and all of them need to be applied to provide effective solutions. This basic model of an information system indicates how we start with relevant and significant data which are contained in particular data sources. These sources may either be records or bibliographic texts. The data is then subject to interpretation by people in a particular environment or context and we end up with information. The important things to stress in this model are firstly, that the nature of the source and therefore the reliability of the data needs serious consideration, and secondly, that the environment or context within which interpretation takes place can also be of major significance in the process of validation. The specific conclusion is that the source of the data and its context must be managed as well as the data itself.

The second key issue I'd like to talk about relates to information as a resource. This is not of course the first time this morning that you have seen something along these lines. Analysts have traditionally always seen three vital resources for all organizations:

people, money and premises, including property and equipment. These resources all contribute critically to the success and effectiveness of each organization; any reduction of the resource means reduced effectiveness. These vital resources are seen as irreplaceable or at the very least only replaceable after substantial investment of time and effort. Increasingly, as has been said, information is seen as the fourth vital resource. Like the others, information cannot easily be created, replaced or reconstructed after demolition except through years of effort. It has been suggested that over 30% of all organizations in Britain that suffer a catastrophic fire, for instance, will entirely cease to operate within 12 months of the fire. This is mainly because their vital information has been lost forever. Now *good* records management will protect this vital resource and I would advise all the organizations that you represent to consider very seriously the early introduction of effective records management before it may be too late.

Now the last key issue I wish to discuss is one which brings all the others together and concerns the need to see managing corporate records merely as one element within a corporate information strategy. By using a strategy the records system itself can be linked clearly and deliberately to the main objective of the organization. There is no doubt at the moment that far too many individual information units like libraries and archives operate in complete isolation quite unconnected to the overall objective. An information strategy should grow naturally out of the normal processes of managing any organization. The crucial factors involve determining the key requirements for success and then the data which is needed to facilitate that success. Now one of the advantages of a strategic approach is that it leads to the most appropriate choices of programme for managing corporate records and these choices involve real benefits to the organization.

I have put these under four main headings and would like to address the benefits in those terms. The financial benefits first. These are perhaps the most immediately obvious but also the most difficult to rate precisely. It is true that a good records management programme may produce space savings of up to 40% and that the difference in property costs between urban and rural areas is often so great that moving a large volume of semi-active records or archives to store out of town provides very significant and immediate savings. It may also be the case that less of the annual budget is spent on filing equipment, or that staff time spent on retrieving information is considerably less. These savings of course, and they will be real, need to be offset against the cost of investment in records management. The overall financial benefits may need to be calculated finally in terms of the value of the information itself to the organization.

Now the second range of benefits I have put under the heading of managerial, and these include the improved control over a major resource in the organization and better access to necessary information which leads to improved decision making. One other managerial benefit I would mention is the ability to identify and then to protect what are generally known as vital records. Briefly, these are those records without which the organization cannot function, for example, records establishing property rights or money owing to the organization. It is a major benefit to have been able not only to identify such records, but also to provide adequate protection against any or all of the disasters that records are prone to, whether fire or flood or just natural disintegration.

The social benefits of managing corporate records are various and more disparate. I will mention just three. First there is certainly an enormous improvement in staff morale. This is true both for those people who handle and process records and for those who generate and use them. Secondly, good records management involves a knowledge of and compliance with whatever legal requirements there may be which affect the creation, retention or availability of corporate records. And thirdly the effective management of the records will also ensure the survival of the best possible archive; a tiny fraction of the total number of records generated, but a fraction which represents the recorded memory of the organization.

The last type of benefit which I will consider is the strategic benefit. Such benefits describe the effect that good records management has, firstly on improving the competitive ability of organizations who see their main aim as running a business, and secondly on the effective achievement of goals by those organizations providing a service.

To conclude this paper I would like once again to stress the necessary qualities of a disciplined approach to managing corporate records. Whatever else it is, good records management must be achievable, affordable, manageable and understandable. In order to achieve good records management, probably the most important factor is the commitment to the whole programme by senior management within the organization. For a one man operation this is nice and easy, but for a large company or a government department a great deal of time and effort will be needed to persuade the key figures in the organization, those with the understanding and the drive and the power, that good records management is necessary. In order to afford records management the organization needs to consider not just the resource costs of introducing new programmes and perhaps new staff to run, but also the savings that will be made. To be manageable good records management will need to be essentially simple. It is clearly better to choose broadly based programmes with the widest possible significance rather than putting effort into delicate modifications of existing procedures.

Finally, to understand your records management systems you need two things: first of all the systems must be straightforward, and secondly, the people who implement them and the people who will use them all need good and appropriate training. With these basic elements in place the process of managing corporate records will at least have started from the right point.

Machine translation and the documentation process

Christopher Cynkin
Interverbum AB
Stockholm

Introduction

During the course of recent years I have conducted my own independent study of the current activity concerning machine translation and computer-aided translation. My goal has been not only to collect information, but to make a recommendation as to what position my own company – Interverbum – should take vis-a-vis the developments in the field, i.e. is machine translation, or can it be, a useful tool within my company's operations?

In order to gather information I have attended a number of conferences held wholly or partly on the subject of machine translation, been in contact with universities and other institutions, and taken part in studies and assessments conducted within private industry. I have also had access to the various reports and books written on the subject.

My talk today will contain some historical background information, a partial review of the products on the market or under development, and the conditions I feel must be met for the successful implementation of machine translation.

Brief history

Almost from the inception of computer technology and artificial intelligence, machine translation has been seen as one of the beneficial uses of computers. Forty years ago hopes ran very high and the problem of translating one natural language to another was expected to be relatively easy. Why it should have been thought that one of man's most complex creations – language – could be transformed into a totally systematized logical form can be discussed at great length. Suffice it to say that the early attempts at machine translation were not terribly successful. Words, even when put down on paper in a very controlled form, not only have several meanings but also have a significance which can only be understood from the context, i.e. in "reading between the lines". Thus far, the computer has not been developed that can interpret figurative as well as literal meanings.

The Americans commissioned the ALPAC report in the mid-sixties to determine the future of machine translation technology within their country. The report concluded that machine translation had no future and recommended that no further R & D funding be forthcoming from the government. The ALPAC report fairly effectively killed any further development in the US for the time being. The Japanese, however, refused to accept the ALPAC findings and continued on their own. In the mid-to-late 70s development resumed in several countries and in the mid-80s the information

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explosion, developments in the Common Market and an increased demand for high-tech consumer goods produced on a worldwide basis meant that translation needs skyrocketed. Of course, the rapid development of computer technology also made possible solutions which were not feasible previously. At the moment interest in machine translation is very high; the expertise of linguists is being used and a number of companies maintain that they have successfully implemented machine translation technology.

Approaches

From the outset it should be stated that there is a difference between computer-aided translation and machine translation. Computer-aided translation uses software to help the translator in his work by offering suggestions to word-by-word or phrase-by-phrase translations to the target language, grammar and spelling checks, etc. The translator still performs the translation from rough to finished form through the use of this software to speed up the process and help maintain consistency of style and terminology. There are several such software products on the market; some are part of wordprocessing software packages, others can be bought separately and are compatible with major hard- and software products.

The question is, how useful are these tools? Since they are meant for general use, they all need to be adapted to the particular user's needs. It takes time to adapt, for example, a spell-checker to the more or less unique terminology of a particular company. I would say that most highly-experienced translators find consulting books and their own well-trained eyes just as effective, though many may disagree with me.

Machine translation, on the other hand, is the computerized translation of texts from one language to another. Early on it was thought that a properly developed machine translation program would be able to produce a finished translation. This level of performance is no longer expected or even thought possible in the majority of cases. At best MT can provide an 80-90% correct translation which must be edited to a final form by a human translator. Under ideal conditions, a translator's output can be thus increased by 300-400%.

Today there are basically four philosophies behind the development of MT software: the direct approach, the transfer approach, the interlingual approach and a combination of transfer and interlingua.

The direct approach is the simplest and, as the name implies, works through directly matching up words and phrases from the original text to the target language. This can work reasonably well so long as the documentation to be translated holds to a very limited subject area and the language used is extremely simple.

The transfer approach to machine translation means that the program converts one language to another and works only in language pairs. Different programs make use of this approach with varying degrees of complexity. Today, most MT programs work on the transfer model and those who have developed them maintain that transfer is the only way to achieve reasonable success.

Interlingual MT works on the premise that there is a common denominator between languages, especially between languages belonging to the same group, e.g. the

Romance languages. The input language is broken down to an interim form and then translated to the target language with the help of dictionaries, parsing etc.

The combination approach uses both methods and is meant to be especially useful when translation has to be done within a wide range of languages such as the current nine languages of the Common Market.

Some MT products on the market or under development

Aside from slightly different approaches to the programming aspects of machine translation, the hardware needed can vary from a mainframe to a mini-computer to a PC or workstation. As hardware becomes more and more miniaturized, the general trend is towards MT being used in PCs and workstations.

There are, at present, about 40 MT programs in operation or under development, but many have been designed for specific uses (research, specific texts) and quite a few have been developed in Japan where Japanese is necessarily the main point of departure. Here I will summarize briefly those which may be of interest to the present audience.

SYSTRAN is perhaps the oldest of all the functioning MT programs and now exists in several versions. It claims to be able to handle 15 languages and the goal of the developers is to produce high-quality rough translations without post-editing. The original version is still in use in the US and translates about 100,000 pages a year for the military. Within Europe, the system is operated commercially by the Gachot company through a mainframe near Paris.

ALPS is also a mainframe MT program which can handle all the major European languages. The original intent was to develop a highly user-friendly system. From what I understand, the user-friendliness impaired the speed of production. The program is no longer marketed and is used as a translation tool by ALPNET, a large international translation company.

EUROTRA is being developed by the Common Market and in its final form will be able to translate freely between all nine Common Market languages. Development is severely delayed, however, and such criticism has been directed at those working on the program. One interesting point is that the designers are building the first version around telecommunications terminology.

LOGOS is a fairly successful system working with the language pairs German to English, French and Spanish and English, to German, French and Spanish. LOGOS is in the process of developing a PC-based system.

METAL is a PC-based program developed by Siemens and can handle the major European languages. It is said to be fully-functioning and has been bought by a number of companies, of which Philips Communications is one. I have recently heard, however, that Siemens may discontinue the marketing of METAL.

TOVNA is a fairly recent system developed in Israel. It is PC-based and works from English to French, with English to Russian and French to English under development. TOVNA claims to be a teachable system and highly interactive. It was purchased last year by the World Bank in Washington DC.

Conditions for successful implementation

Any company or institution considering the purchase of an MT system must be prepared to meet certain conditions prior to attempting to implement the system into its operations. These conditions, or prerequisites, can be broken down into the following:

1. Type of documentation
2. Document production
3. Personnel
4. Investment

Type of documentation

First of all, an analysis must be made of what type of documentation the company produces. MT is best suited for parts lists, instructions installation procedures, etc. A company or institution producing sophisticated descriptions of products and/or methods will not have much use for MT, at least not in the near future.

Document production

How are the documents produced? Do individual designers, for example, write documents according to an agreed-upon format, but without much guidance as to language? If so, this means the style of the documents will vary considerably, even if the subject matter is the same.

How are the documents stored? In archives, in mainframes? Do the company's computers run under DOS, UNIX etc? Texts which have to be typed into an MT system will greatly reduce the system's advantages. The documentation should be easily retrievable as data and easily stored.

Does the company or institution have a terminology database? Most major companies now have such databases and it should be determined whether the contents of the database can be transferred to the MT system. The feeding in of thousands of terms, in at least two languages, manually is very time-consuming. Precise, controlled terminology is the heart of any MT system.

How does the company or institution currently handle its translation needs: in-house, through consultants or translation companies, or a combination of the two? Is there a department which can handle the implementation of an MT system?

Personnel

In connection to my last point, unless the company works in close co-operation with a translation company which might have the means to invest in MT, the buyer of an MT system must be prepared to involve his personnel in the implementation of the system. Though it is often viewed as such, the process of translation is not purely a matter of production. MT cannot replace translators the way a particular piece of machinery can replace a certain number of workers in a factory. The supplier of an MT system must be willing to work closely with the purchaser, providing training, further development and feedback.

Investment

It has been estimated that translation costs run to a total of 20 billion dollars per year worldwide. These costs, however, are often hard to trace within a particular company, especially a large one. Connect to this the fact that documentation as such is often considered a poor relation to the product, and it is not difficult to understand why many find it difficult to make the major investment that an MT system involves in time and money. Such an investment is long-term, and we prefer the short. A total and conclusive analysis of the company's documentation and translation process must be performed before any decisions are made. Management must know what it's getting into.

Concluding remarks

The history of machine translation has been a stormy one, and the current MT scene is divided between true believers and doubting Thomases. Still, the international translation need is so large and so pressing that there is an enormous will being exerted to make the idea work.

I think that experience has shown that, in those cases where machine translation has proved to be a viable solution, the companies or institutions opting for it saw the need of far-reaching changes in their documentation operations and/or were presented with new, massive demands on their products and services. These demands and needs required drastic solutions, not only to translation methods, but also to their whole documentation process.

Everyone is well aware of the rapid changes taking place in all aspects of life in the countries of eastern and central Europe. Machine translation may well be one way of meeting a certain number of those changes.

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Pewex-Karen – a case study

Andrzej Gorski and Chuck Puck

Andrzej Gorski

My name is Andrzej Gorski and I am one of the directors of the Pewex company. I don't have to explain to Polish people what the company is, but for the benefit of people who are in Poland for the first time, I'll explain something of the company.

We are probably one of the biggest trading companies on the Polish market. The total turnover of the company is over 1 billion dollars yearly. We possess over 1000 shops. We have eight branches in all the major cities of Poland which organize the company; the headquarters is in Warsaw.

The company deals with over 20,000 items and running a company of that size without a computer system is impossible. The company has grown rapidly in the past three years and we tried to introduce a computer system, but failed, so we set out to find the best system we could introduce, which would cover all the areas of our activity i.e. importing, transactions, storing merchandise, moving merchandise to retail outlets and selling. Mr Chuck Puck will now describe the technicalities of the system.

Chuck Puck

As you heard from Andrzej, Pewex is a large company and has over 9000 employees and 1000 or so retail outlets in eight different regions. The system we brought to Warsaw specifically for Pewex is a unique computer system. Only about 10% of US companies are using it, and it has unlimited capacity. It is written in a fourth generation language called Progress, and it is built on a relational database management system. Currently, Pewex has 11 different modules; all the applications are modular. There are five modules which control company spending and four for income and profit control.

We have adapted 2 top-of-the-line systems – 4/490 for the Pewex headquarters, and 4/470 for the regional level. 4/490 computes at the speed of 22 million instructions per second. It has close to 160 terminals and has the capacity to expand. The difference between the systems is very little. Of course you can do more with the 490; with the 470 you have less of a networking facility.

I have here a reel that has 2400 feet of half-inch tape in it. This stores, roughly, 50 MB. In my pocket I have an 8mm cartridge which takes 46 of the 2400 feet reel, and only costs $7.50. What is the capacity of this tape? 2.3 gigabytes!

In terms of backing up the data, using this to back up the reel would take four days attended backup. Using this you stick it in the machine, you go home. It does the backup automatically, unattended, and when you come back to the office in the morning it is all done.

The modules

Let's talk about the applications modules more specifically. Those 11 modules I talked to you about are separated as follows.

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Purchasing

The first thing you have to do in the company is buy the products. This application we have acquired for Pewex is a combination of distribution and retail operations.

Going back to purchasing activities — you don't want it just to buy the products, you want to buy the right merchandise in the right time frame. How do you do that? You have to know exactly what you have in your warehouses, and this company has fifty or so warehouses.

This purchasing module gives you, in nine different standard reports, a complete picture of what you have on order, attaching to what you have in the warehouse. It tells you when the order is going to arrive; if it is delayed it will give you the anticipated date of delivery; it gives you supplier performance; if the supplier has delivered consistently which suppliers are late. So you have a chance to decide which suppliers to go with. I have noticed that in most of the stores there is a problem with the consistency of the merchandise. One day you go in there and there is ABC merchandise, and the next there is DEF. This system will tell you exactly what is fast moving, what is slow-moving, what kind of merchandise you want to stay away from.

The module itself has two important functions. It maintains all the master data files in a maintenance file which you can go in and change. It also has a transitional mode, the menu, which captures all those day-to-day operations – what is happening in the warehouses, the stores and at the headquarters.

Auto processing

Now that you have purchased the products you have to ship them. For that we have the auto processing module. It issues invoices, it tells you by looking at the inventory at the warehouse, how many you have, what has been allocated for shipment, how many will need to be shipped in the future. This transfers the information to the purchasing order module. It updates what you need to buy in the purchase order module. At the same time this order processing module provides very detailed sales analysis. It gives you a sales history for each customer, year to date, last year, what you can expect to sell to the customer. At the same time it generates an invoice register, it gives you your gross margin. What profit are you making by selling certain items to certain customers?

Inventory management

The next module is the inventory management module. What it does is capture the information from the order processing module as well as from the purchasing processing module, combines this information and tells you exactly what you have in the warehouse. As a result of that it tells you items you are short on so you can speed up the purchasing of certain short items. It gives you a complete picture of on-hand warehouse stock.

Out of this module comes the ABC report. This tells you what product mix contributes to 80%, 15% and 5% of your total sales. Thus you can discover the market trends, what your customers want.

Another report is the inventory study report. It highlights what's fast-moving, what's slow moving, so is therefore telling the top management what to do.

Throughout these 11 different modules there are 77 built-in standard reports that constantly indicate to the management what to do. It gives you 149 journals and listings. You don't need all of them, but if you need more details it will give you more.

Accounts received

Now that you have the warehouse under control, time to collect money from your customers. For that we have the accounts received module. What this does is collects the info from auto-processing by virtue of having generated the invoice already, and pipes that into accounts receivable. It keeps track of, by customer and by date, what each customer owes you applying to that money they collected, so as a result it gets posted into the account, so it keeps your net balance. At the end of each month, you can send a monthly statement available to your customer, highlighting what shipments they received and how much they paid in.

The accounts receivable module is aged over, 30, 60 and 90 days, plus 120 days for some companies. This tells you how much you can expect to collect from you customer within 30 days and which customers you need to go after to collect money owed.

This module is pivotal and critical for cash management. As you know, you must know how much money you expect to collect within what period of time.

Accounts payable

Having collected this money you must now pay your suppliers. For that we have an accounts payable module. This keeps track of all outstanding unpaid invoices to suppliers by customer, by date, by some kind of period you want to specify. Suppose your supplier gives you a 30-day term. At the time of inputting an account payable invoice you can put in a 30-day due date. If you have a 60-day term you can put that in and it will hold the invoice until the 60th day comes up.

Payroll

Part of the money you collect must go to employees – we all know that! For that we have a payroll module and what it does is computes the total amount of money payable to employees, by department, by branch, by region. On top of that it computes taxes payable to the government.

Fixed assets

The next module is known as the fixed asset module. When the company acquires assets – land, buildings, furniture, fixtures – it assigns an asset code to individual items by location. A report can be generated, sorted by location, type of property or by value.

The next module is known as the general ledger. You have to have a module which collects the information from all the other modules in order that you have an overall picture of what has happened in the company over a given period of time. Financial statements can be produced such as F01, F02 (year-end statement), F03, F04 (balance sheet) and F05, which is a detailed fixed-assets report. You can have more reports than this – it is a matter of how you format the system.

The general ledger will give you a total for each module which has been interfaced into. One of the regions in Pewex, currently using a chart of accounts totalling 3,000 accounts, by modulizing and distributing the information correctly to each module able to cut the number of accounts to 200. Account numbers consist of synthetic and analytical accounts. At Pewex we use 5 digit account numbers. The first three digits are synthetic, the next two are analytical. As you can see the system simplifies accounting control.

Those are all of the modules. In addition, Pewex has a development tool called a power-tool. This is an in-house programming tool and you can create new applications with this. You don't need to hire expensive programmers – it's just a matter of understanding how the files are structured.

The system is a database management system (DBMS). Let me give you an example of the difference between a non-relational DBMS and a relational one. In the old days if you were in one application, in order to go to the next one you had to exit all the way to the front-end then you had to start again to go into the next module. With a relational system you just type the two first letters. Lets say you are in accounts payable (AP); all you need to do is type GL in the top right-hand corner to get to the general ledger. This saves a lot of time, provides greater speed for doing some of your day-to-day work.

Office automation

One last module is the office automation module. There you have the word processor, spread sheets and graphics. Currently Pewex has Wordperfect. It works in a network environment. Most of you know what Lotus is; in a Unix environment the spread sheet used is SCO. It plays the role of adding machine, working like a word processor to a certain extent and you combine these two to make you office management system work.

Passwords

All these modules are protected with a three-level password system. The first level of the system is Unix level. When you allow a user to use the system, you have to give him or her a specific password. That employee is the only one who knows about that password and this helps you to keep track of what that employee does. It gives you some amazing analysis – what time that employee entered into what file and what was done in that file.

The second level of the password system is located in the application side of it, under a user name. The third is by function. Suppose you don't want certain individuals to have access to, for example, the general ledger. You can change the level of functional password.

That's pretty much what I have to say – to give you any more detail would take a couple of hours!

Question time

Question time for Session Three was chaired by Aslib's Chief Executive, Roger Bowes.

Krzysztof Zieba, ART-B
I would like to ask a question first to Mr Ian Day and later on to the gentlemen representing the project KAREN-PEWEX.

So firstly, Ian you said that the only possible agent for the archiving of documents is paper. I would like to find out if from the legal point of view paper is really the only means which retains archival character. I know that it was so for many years, but with the introduction of optical discs, I believe that they also fulfill this requirement. According to me what constitutes the archival feature of agents is that agents stored for a few years, I don't know exactly for how long, do not lose information. Until now only paper had such a feature. Now optical discs have it, especially WORMs – Write-Once-Read-Many. Could you please comment on this?

And the question for the gentlemen from the KAREN-PEWEX project is as follows. I would like to learn more about the structure. We know that it is a Sun computer, popular all over the world and selling well in Poland. Is the structure based on the central CPU, central server and terminals or do you intend to establish databases in the eight regional centres? That is, will this be a network or only terminals?

Secondly, I would like to find out from the director of Pewex what the costs are (of the project) and how long it will take to implement it. What is important is the question of Polish characters. I suppose you don't use Polish characters? Thank you.

Roger Bowes
There are three questions then. Ian, could you answer the first one, please?

Ian Day
The point about the durability of paper still stands, I think. It is true that the development of optical discs over the last few years suggests certain possibilities for archival storage. The durability of optical discs appears, from the tests that have been carried out so far, to be reasonably long-term. The latest I hear in tests of the British Library on documentary storage is that thirty years would seem to be a reasonable estimate. Of course, archives generally would need to be kept permanently. Paper itself, since about the 17th century, has not been of sufficiently good quality to last forever and so I suppose that it will certainly be true to say in a few years that optical discs could be used for archival storage as long as the facilities to transfer to another disc every thirty years or so are available. I hope that answers your question.

Roger Bowes
That sounds good. Thank you Ian. Chuck, would you like to answer (the question)?

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Chuck Puck

First of all, I think the first question was whether the CPU will be located in each headquarters or region? Yes, you are right. The CPU, central processing unit, is located in the headquarters and access is through the old type 2 terminals, so everybody in the company will be accessing the same database.

Roger Bowes

Thank you very much. I wish you the best with your optimism. Could we have another question, please. Yes, Sir, in the front.

Ryszard Marus, Mining and Steelwork Corporation

A question to Mr Horton. You mentioned something called an information committee in a company. Could you tell us about its structure, who should participate in it from the company and say a few words about its aims?

Woody Horton

I think that such a committee ought to be composed of at least one representative from the major operating staff units within a company. This is not limited to companies — we could also be talking about universities, government agencies, associations etc. So, for example, in a classic profile of an American corporation you would have somebody from marketing, somebody from R&D, somebody from production, the corporate legal office and so forth and so on. Perhaps, ten, fifteen or twenty people at the corporate headquarters level. I have suggested that the corporate information management office not play the lead role for tactical reasons, but rather ask one of the line staff operating people to be the chair of that group. Partly, for obvious, what I call tactical reasons, so that they can not be perceived as having their own agenda. Rather they can play the secretarial role and those of you who have ever worked in organizations know fairly well that sometimes playing the secretarial role can be even more effective than playing the chairperson role because you get to invite people and you make up the agenda.

In terms of what kinds of issues come up, this is virtually a laundry list of what I didn't have time to fully go over. But, for example, it could draft and consider recommended corporate information and information management and policies. What should they be? Now, to *approve* them is the function of the executive level within the company. They can recommend information and information technology standards and guidelines. For example, if the company is thinking about standardizing on two or three brands of hardware, PCs for example, or standardizing two or three brands of software, it might draft and recommend what those standards and guidelines should be. It could draft a strategic information plan and act as the focal co-ordinating point to bring together the business plans and melt them together with the information plans. Again the key word I am using is that this forum is not a decision-making body. It's a drafting body, a staff body. But it is a single focal point and the other key issue is that it needs to consider not just the technology, but information itself, including records and archives, statistical matters and anything having to do with information handling.

Roger Bowes
Woody, would they in the structure, would they operationally report to the Chief Executive Officer? Because, I mean, wouldn't you have the director of finance, director of personnel, director of information? Who is going to take this initiative?

Woody Horton
All their designees. That is the matter of the organization culture. I would say that in some organizations that form should report to, perhaps, to the chief operating official or the deputy chief executive or in some cases, perhaps, if the chief executive himself has a special interest in the area, they could report to him. For the same reason I mentioned earlier, I would resist particularly if the chairmen were drawn from an operating department such as marketing or production, that would report to the chief information officer. I would rather reach the model I had suggested, of them playing the secretarial, drafting role and in that way the organization perceives it as being operationally in control of it. But it could work the other way. I come back to the term, whatever the organization culture is comfortable with, in that kind of an arrangement. Because this idea is not unique to information. There are organizational personnel committees, finance committees, new projects committees and so forth. So I would try to fit it with whatever formula makes sense to the culture of the organization.

Roger Bowes
But it is one area, unlike those other areas, which needs driving from the top.

Woody Horton
Oh, indeed, it does.

A delegate
I have a question to Mr Sutherland. I represent the faculty of economics and we turn out specialists in the field of food technology. We are at present preparing the curriculum and could add a few hours of lectures or tutorials. Could you tell me what is it like at your university? What classes do you combine with your class? Could you give me some more information about it, please?

Ewan Sutherland
Yes, I think you have a number of problems. One is that students expect, and that is quite useful for potential employers, that they can use computers. I do not mean by this that they can write programs. I mean that they can do wordprocessing, that they can do spreadsheets, they can use some of the more friendly aspects of the database management systems. So any student should, in that sense be what is sometimes called information literate; they should be able to perform a role in a company.

I am involved in teaching on a BA program and on undergraduate business studies programmes and part of what we are doing there is explaining to the students how you can apply the sort of case studies I spoke about to business strategy. So once the students have taken a class in business strategy, it's then possible to go on and look at strategic applications of information or of information technology. So what one is doing is looking for case studies and methodologies which can be applied in their particular area. Where the problem arises is in trying to give students a skill that disappears very rapidly. New packages come along. They become easier and what one wants to do is provide knowledge and reference frameworks which will still be of some value in five years' time. It is trying to give people a feel for what will happen in the future, some framework, some reference that will still apply in five or ten years time, in the same way that, when you did physics it's still true today. And that is much more difficult. Most of that still comes from case studies.

Roger Bowes
Thank you. Thank you Ewan. Another question please. Gentleman in the front again.

A delegate
I am from KAREN. I am the president of the firm and I would like to add a few comments with regards to the installation in Pewex which we have carried out. I would like to point out the uniqueness of this implementation. The installations of this type were carried out in hundreds of western European companies which were introducing computer systems, so it is not unique in this sense. What was unique was the fact that this system was implemented in Poland to a large extent with the assistance of foreigners. Software and hardware also came solely from America. And the problems which we encountered existed on the co-operation line between Poles and Americans and showed many problems associated with cultural adaptation of the American and Polish programers and system analysts. There were some comic situations, for example one of the American system analysts was afraid to come to Poland, afraid that communist rule still existed here and that if we didn't manage to install the system properly he would be sent to Syberia. So there were some fears on the part of the Americans. And again the methods of work of Americans and Poles also differs a lot. For me it was quite a surprise, but we managed to cope with those problems, although they were not the easiest.

So the fact that we implemented a system in a company as large as Pewex is not in itself a unique or special achievement. We used software modules which are standard, which we didn't write from scratch. We referred to the Unix and Progress operating systems which have been being developed in the West for many years. The application system, VARNET is relatively well known in the West and we had to adapt it to the Polish conditions. We did not only have to make some adaptions in order that Poles and Americans could work together, but we also had to adapt the system to the Polish regulations which are different from the American ones, characters, names and problems of this sort. All this had to be adapted. The taxation and payroll systems are different in Poland.

We had to guarantee Americans a reasonable standard of living in Poland. For some reason they very much disliked one of the hotels, so we had to move them to another one. However, this turned out to be very expensive so we had to hire some apartments in which they are now staying.

Finally, there were some purely human problems, not technical, but ones resulting from the fact that sometimes an American working with a Polish programer can't communicate and it is not because they don't want to, but because they view the world in a different way.

Seven months have lapsed from the moment we commenced. We are on the point of completion and we are going to hand over the system to Pewex. We are sure that Pewex won't like many things in this system because that's life and we are ready to make corrections. We now know how to deal with misunderstandings between Poles and Americans. We didn't know at the very beginning and it caused considerable problems.

There was another problem regarding licence, which any other company trying to arrange a similar co-operation with the Americans, English or French may encounter. Sometimes it's difficult to obtain an export licence for high technology products. We had some bitter experiences, but it has ended well and the Sun system is at present in Pewex. Thank you very much.

Roger Bowes
Thank you very much. Congratulations on your achievement. Could we move on to another question, please. The gentleman in the middle.

Krzysztof Polkowski
I have a question regarding machine translation. As we know it is an important area at a time when Poland is getting closer to Europe and vice versa. Are there programs available for machine translation from the EEC languages into Polish and the other way round either from your office or maybe somewhere in western Europe, for microcomputers and to begin with in the subject area of politics and economics? And to take the opportunity to ask again the second question, which hasn't been answered, regarding Polish characters. How do you cope with the old problem which for Poles is the code page? What standard did you accept? This I believe will be important for further development and applications in Poland especially for those who will co-operate with you.

Roger Bowes
Yes, Christopher.

Christopher Cynkin
The answer is very simple. There are no combinations of Polish and west European languages among the machine translation systems. However, my personal advice is not to wait as no one will do this for us. A small tip: the Polish language is associated morphologically with the Russian language and the co-operation between the Poles and those from the Soviet Union, who also have very interesting achievements in this field, certainly could accelerate this very wearisome, labourious process of achieving a standard from which you can start fiddling with it. Because at the beginning it is an academic play and only later on can you start working on it.

Roger Bowes
Thank you. Chuck?

Chuck Puck
Well, translation is a task, no question about that. But we're using Televideo 965 which can be adapted to 127 different languages. Anyway, what we are doing right now is, we are leaving the program alone, we are not translating programs. OK? Which makes sense. We are translating each menu-screens so that the employee who doesn't understand English can operate either through transaction mode or a mail system. The system that the Pewex has, has built-in documentation. You know the word? If you push your function key F2 it will tell you what you need to do within the specific field that you're translating. Therefore there is quite a bit of translation to be done and unfortunately at this point we're not doing total translation, but that's the way we're doing it.

Roger Bowes
Thank you very much. There is a question at the back. Yes?

Michal Tasiemski
I would like to partly answer the question from the gentleman about machine translation. My own company, Lexilab, together with the computer company P-CERTUS from Jaroslaw is working on this problem. A note about it appeared in No 12 of *PC Kurier*. The program is called Lexitools and we can already do some machine translations, although rather clumsily. If any of you are interested I am at your service to provide some explanation during the break.

Roger Bowes
Thank you. Thank you very much. Could we have one last question. All right. Two more questions. That's it though. Those over in the far side first.

A delegate
Excuse me we haven't received the answer to the question regarding what character standard has been accepted in the project Pewex-Karen. In Poland in fact, there are no standards. One has been accepted, another exists *de facto*, still another one is used quite frequently. What standard of Polish characters did you accept?

Chuck Puck
Could you be more specific, please. What standard?

The delegate
The problem with Polish characters is the problem of their presentation on the screen, the keyboard, in the application and the printer. The characters are listed in the table of ASCII codes. In order to include national characters other than those specified in the ASCII codes, table one has to use certain standards. The standard prescribed in Poland

and recently accepted is called ISO Latin 2. It is a bit different with regard to microcomputers. As far as they are concerned the standard accepted is *de facto* the one advised by IBM and Microsoft called IBM Latin 2 and in Poland, also popular in many applications, is the so-called Mazovia standard. What I have in mind is adding Polish characters to the second part of the ASCII table, and to replace already existing characters with Polish characters. The problem is which characters to give up? and that's why it is difficult to establish one standard. It is this that I am asking about. What solution has been accepted? Perhaps, someone knows.

Chuck Puck
What we're doing right now in Pewex is translating straight from the keyboards without showing the particular characteristics of a certain letter. For example you have 1 with a slash going across. We don't use that type of key. We are adapting to the Polish characteristic, but without that particular characteristic showing. At this point that's all we can do, that we've been doing. I realize the ASCII file has a certain characteristic that you have to employ, but we haven't done that kind of expansion into the look-alike translation. We have tested with the Pewex employees, they understand. Firstly, obviously they had a problem with the English language and after we translated it into this format, most of the employees were able to understand, and able to operate it. I think that's as far as I can say.

Roger Bowes
I think so too. Just the last question. That gentleman over there.

Richard Lucas
I am a British consultant to Unicard and I would like to make a comment and ask a question. The comment is concerned with plastic cards technology and in particular credit cards technology, the verification of Visa, Mastercard and so on. Unicard is involved in all kinds of plastic cards business. We are making the badges that everyone here is wearing. But also in meetings with Visa International we are concerned with the verification technologies...

Roger Bowes
Sorry, is this a question?

Richard Lucas
Yes, it's a question concerned with the verification of data. Because we discussed earlier the problems with waiting for the telecommunication system to come into line with international standards. And my question is whether in the case of Pewex there are any contingency arrangements for other forms of data distribution such as radio, telex. We discussed satellite to take the place of telephones when telephones won't do. Because for us, we need to go ahead with technology distribution – sorry, data distribution and data capture – right now in the next 12 to 18 months and that's the basis for my question.

Roger Bowes
Yes, telecommunications is holding up the real progress.

Richard Lucas
Well, beyond that. What to do in the interim?

Chuck Puck
The answer to one of the questions you asked that refers to the cash registers. The cash register we are using here is the Mile Call, the 101. It has a separate slot for your plastic cards to be able to operate through. Again I am looking forward to the day that the line is hooked to a central bank somewhere, so that then everybody is given credit cards and you can access it just like in the US. If you go to the grocer's store you don't need a cheque, all you need is plastic and the balance is charged to your account. But I'm sure that that will come. What the cash register also does is the verification of your cheque. It does an automatic endorsement, but then what I am learning is that cheque writing is not that popular here so, that will have to wait.

Roger Bowes
Ewan, you wanted to say a few words.

Ewan Sutherland
I was amused last October to be told on visiting Moscow that they were planning to introduce plastic cards into the Soviet Union. It took me a while to work out why. Eventually someone explained that it was the best way they have figured out of getting rid of black market economy because they could then track all the money, there would be no cash and they would be able to follow all the transactions. But it takes many years to build up the infrastructure. The only way in which you will see the telecom's infrastructure coming into place to support all of these plastic cards is partly through the general development of telecommunications, but also using the opportunity to bring the link in, for example, to the American Express office which is just a few hundred meters from here, to use the beginnings of those links as a cost justification to bring the new telecoms and bringing those new links in will allow you to gradually expand that. But those transactions rely effectively on foreign currency, on foreigners spending lots of money.

Roger Bowes
Thanks Ewan. I found this morning a fantastically exciting morning. I hope you did. The fact is it's been very, very good. Now, I would like to thank Ewan Sutherland, Woody Horton, Ian Day, Christopher Cynkin, Andrzej Gorski and Chuck Puck for all their hard work, for their effort and for an excellent morning.

The role of the healthcare information officer

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Abstract

Following large-scale automation of the information functions within the NHS, a large number of new information-related posts have been created. The role of the Healthcare Information Officer (HIO) is examined in relation to information provision, the development of information systems, staff supervision, training, liaison with other healthcare professionals; the organisation of libraries; and the Data Protection Act. The main conclusion reached is that, as information professionals, HIOs have a multi-faceted role to play, with extremely wide-ranging responsibilities which draw on knowledge and skills in the areas of information analysis, systems analysis, library and information science, and computing and management.

Recent changes in the structure of the National Health Service (NHS) have led to a greater demand for accountability on the part of senior managers. As a result of this, the need for more substantial and more accurate management information has led to the introduction of new information systems and to the creation and development of new information-related posts at all levels. The role and function of healthcare information managers – the term used to cover those with overall responsibility for the use of information and information technology in healthcare units and districts – has been covered by this author elsewhere (1). This article seeks to examine the role of the healthcare information officer (HIO) by investigating the context in which HIOs work; the range of job titles; and the roles played by HIOs in relation to: the provision of information; the development of information systems; staff supervision; training; liaison with other professionals; the organisation of libraries; and the Data Protection Act.

The main source of evidence for this article came from an analysis of 44 information-related posts, at middle management level, advertised in the *Health Service Journal* in the past two years. Using this evidence, the article seeks to examine the multi-faceted role of the HIO and the need for recruits to HIO posts to have a combination of knowledge and skills drawn from different information-related domains.

Context

In the past few years, the NHS has attempted to transform itself from an organization which failed to produce much information in a form which was useful to senior managers and was also unable to collate information from the many disparate units in hospitals and districts, into a more efficient and effective organization which has installed sophisticated information systems and employed a range of information

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professionals in order to provide greater accountability in relation to its expenditure and its services. Several government papers such as *Working for patients* (2) and the Korner reports (3) together with NHS initiatives such as *Resource Management* (4) and *HISS* (5) have provided the impetus for hospitals and districts to develop their management information systems and to increase awareness in all areas of the NHS of the importance of information in the development of services.

The NHS is, of course, a politically sensitive area and the vast expenditure on information technology and the creation of a large number of new information-related posts in administration have not been without controversy. The politics of the NHS and the new management approaches are outwith the scope of this article.

Titles

The NHS uses a wide range of titles for its information staff. At the senior level, the term "information manager" is increasingly used to describe a person who has organization-wide responsibility for information and information technology in a unit or district. In this author's survey of the role of information managers in the NHS, the main areas of responsibility were in relation to information strategies, systems development, management information, training and liaison (6). At the middle management level, the most common title in the survey of HIO posts was *Information Officer* (31 out of 44). This included 4 posts of Senior/Principal Information Officer and 4 posts of Assistant Information Officer. Other titles included Information and Computing Officer, Information Services Officer, Data Administration Officer and Information Support Manager. The difference in title for these latter posts does not tend to reflect any major differences in the areas of responsibility of the HIO.

Information Provision (7)

The main role of the HIO lies in the provision of information to a range of managerial and clinical professionals. The job description of many of the posts expanded on the characteristics and types of information to be provided. Tower Hamlets Health Authority (HA)'s Unit Information Officer is required, 'To ensure the provision of accurate, prompt and relevant information to meet the needs of managers..'

Torbay HA's Information Officer is, '..responsible for the provision of a comprehensive and wide range of statistical and documentary information [and] for translating data relating to activity, manpower, finance and demography into management information.'

Gateshead HA's Information Officer is involved in, '..the provision of information to Heads of Service to directly support activities and to derive information from data routinely collected in the course of activities'.

This is a very common element in the role of the HIO. Health authorities are responsible for collecting data on virtually every activity in the NHS and in the past, much of the data has remained as such i.e. data collected but seldom analysed, interpreted or put to any further use. The new emphasis on management information in the NHS has ensured that much of the data which was previously redundant on collection, is now translated into useful information. The range of this data can be seen in Lanarkshire Health Board's Information Services Officer who

..maintains data relating to
- movements in population structure
- mortality, morbidity and other epidemiological indicators
- activity levels in the use of the Board's resources
- comparative data for the Board's position in relation to Scottish Health Service averages as key performance indicators

In any context, this is a vast range of information and it appears that HIOs have responsibility and control over a huge amount of information which could not possibly be effectively managed and effectively disseminated by one person.

Information systems development

A key role for the HIO, related to the collection and analysis of information, lies in the development of effective computerized information systems. The NHS has only recently introduced integrated information systems in hospitals and districts. The new systems have replaced a plethora of existing systems, often home grown, which dealt with information problems at a local level, but existed as separate unconnected islands in an often unchartered sea of information. The main responsibility for selecting and implementing new systems tends to lie with information managers. The HIO's role, as shown in West Lancashire's Information Development Officer's post, lies in, '..assisting with the development of information systems/services'.

This role is extended in the case of Walsall HA's Information Officer who has as one of his/her "specific responsibilities" to, 'Assist in the continuous evaluation of existing activity information systems'.

Central Birmingham's Unit Information/Medical Records Officer has to, '..ensure the effective maintenance of existing information systems [and] .. to initiate, develop and implement new systems as required'.

In some cases, very specific tasks relating to information systems are identified as the responsibility of the HIO. For example, Leicestershire HA's Information Support Officer is responsible for part of the co-ordination of the Glenfield Unit's Information Strategy and has, '..specific responsibility for ensuring the establishment of an integrated patient database and its use, in conjunction with clinicians and managers, to provide an effective service monitoring, modifying and planning tool'.

Thus the HIO's role in system development is not merely a technical one but is clearly linked to the analysis and provision of information.

Some HIO posts are more technically-oriented, such as West Midlands Regional HA's Senior Information Officer (Analytical Support). This post requires, '..technical competence in the high level programming language of the SAS suite statistical software..and writing programmes in FORTRAN and other languages', but this is not typical of HIO posts where the emphasis is mainly on the development of systems to meet specific information needs. This may mean the identification of commercial software to suit particular purposes, but does not normally involve the HIO in programming.

Staff supervision

Although HIOs do not have overall responsibility for information provision on an authority or hospital-wide basis, they often have a managerial role which involves the supervision of other staff. Bath District HA's Information Support Officer, working at the Royal United Hospital, has as a "principal duty", 'To supervise a group/team of staff on a day-to-day basis, monitoring working practice and quantifying workload'.

This post also has responsibility in terms of recruitment:

a) To evaluate the need to replace and compile advertisements for vacancies
b) To participate in shortlisting applications for interview
c) To participate in formal and informal interviews

Southend HA's Hospital Information Officer is responsible for the, 'Management of the District and Acute Information Section, including staff recruitment and induction..and, where appropriate, implementation of individual performance review'.

Perhaps more typical of the staff responsibilities of the HIO is West Lancashire HA's Information Development Officer whose duties include, 'Managing the clerical support staff within the department to ensure the effective provision of data'.

From the job descriptions surveyed, it was apparent that there were large discrepancies between HAs in relation to the personnel management function of the HIO. In some authorities, responsibility for a section was a "principal duty" while in other posts, often of a similar nature and salary grading, there did not appear to be a personnel function.

Training

The responsibility for training other information personnel as well as managerial and clinical staff in the use of information and information systems was a feature of virtually all posts surveyed. In this author's survey of the role of healthcare information managers, it was clear that the information manager has authority-wide responsibility for training in information use and it was noted that, '..considerable emphasis is put on the need to train staff in relation to information technology, but more emphasis is put on training in relation to the use of information'(8).

The review of HIO job descriptions produced similar findings. While some HIOs were expected to be involved in training in relation to information systems, the great majority were seen to be responsible for providing both advice and training.

Clwyd HA's Information Officer is responsible for, 'Advising managers and professional staff on the use of information'. Stockport HA's Information Officer has, among the "principal responsibilities", 'To develop relationships with clinicians, managers and staff and provide the use of information as a positive management tool.. and to stimulate and encourage a positive attitude towards the value of and use of management information'.

Leeds Eastern HA's Information Officer provides, '..advice and training on information matters to staff of all disciplines'.

Leicestershire HA's Information Officer is expected to, 'Contribute to the unit training strategy by training clinicians and managers in the use and interpretation of clinical based information'.

One of York HA's Information Officer's main roles is to, 'Promote the use of information by guiding managers and clinicians in the use of information and the development of new reports and by contributing to unit training activities'. Cornwall and the Isles of Scilly HA's Unit Information Officer will, '..assist in developing information management training programmes for clinicians, managers and other priority groups and to participate in training as appropriate'.

The above examples show an encouraging emphasis on the use of information as opposed to technology. Also, the emphasis on information as a management tool (Stockport HA) and use of the term 'information management training' (Cornwall and the Isles of Scilly) demonstrate that within the NHS, there is a growing recognition that information is an important resource and that the information systems now so prevalent in the NHS exist to support the effective use of information. It is very noteworthy, however, that HIOs have a potentially enormous task on their hands if they are to effectively train and advise the large numbers of managers and clinicians in their hospitals and districts. HIOs, it is clear from the job descriptions, are expected to be innovative in the area of advice and training in information use and it would be interesting to discover what training they themselves receive in relation to the expectations on the part of their employers.

Liaison

At the heart of the HIO's job is liaison with other staff. HIO's cannot work in isolation as they are in many ways a catalyst in the production and use of information. An HIO will obtain information and provide information. To do this effectively, s/he must not only know the information needs of the users of information, but also know those who produce data or information. The job descriptions surveyed placed great emphasis on the need for liaison with all other healthcare staff in hospitals or districts.

Great Yarmouth and Waveney HA's Information Systems Officer is expected to take the lead in satisfying information needs, '..whilst working closely with a) Other members of the White Paper Project Team and b) Staff at District HQ and within units'.

One of Cheltenham and District HA's Unit Information Officer's "key result areas" is, 'To liaise with District and Acute Unit information staff to develop an effective information network'.

Stockport HA's Information Officer's first "principal responsibility" is, 'To liaise with clinicians, Medical Records Officer and other staff involved in data collection to ensure a high quality input to manual and computerized information systems'. Tower Hamlets HA's Unit Information Officer is expected, 'To liaise with the District Information Unit, Acute Services Information Offices, computer departments, clinicians, managers and Regional Information Services'.

This expectation of comprehensive liaison with a potentially huge number of other healthcare professionals is extremely common in the job descriptions and it must be questionable as to what extent the HIO can possibly fulfil this function. It would also be interesting to know to what extent HIOs can find time to cope with the demands of information users or providers who approach the HIO for help as well as the potential demands of users who have as yet had little communication with the HIO. This is a very familiar situation for librarians who are often aware of large numbers of potential users who could benefit from their services but who lack the time or resources to make contact with them because of the pressure of demands from existing users.

Organization of libraries

In a small number (4 out of 44) of job descriptions, the HIO is expected to take on responsibilities which would normally be those of a qualified librarian. East Birmingham HA's Information Assistant is expected, 'To develop a district library and information service including setting up a computerized database of literature and a lending system.' Sheffield HA's Information and Data Support Officer is also expected to manage a library and will have responsibility for:

> ..the administration of the library, stocktaking etc..When the RCGP GP-Lit comes online [the HIO] will be expected to transform the library into an active information retrieval system. In the meantime [the HIO] will be expected to scan the weekly literature and extract articles for the attention of the appropriate practice team member.

Cornwall and the Isles of Scilly HA's Unit Information Officer will, '..establish an information resource library and maintain information databases, including local, regional and national performance indicators'.

It was not part of this survey to investigate the backgrounds of the people who obtained the posts advertised but it would be interesting to discover whether professional librarians actively seek posts as HIOs and also to what extent HIOs without library qualifications can cope with the demands expressed in the above job descriptions.

The Data Protection Act

In 5 of the 44 job descriptions analysed, one of the duties of the HIO was to be responsible for ensuring that the HA met the conditions laid down in the Data Protection Act. Healthcare information is by its very nature very sensitive and the rights of patients under the Act have to be protected. Also, certain kinds of healthcare information may be given partial exemption under the Act and it is therefore extremely important that the HIO responsible for compliance with the Act ensures that not only is s/he aware of the Act, but that all other staff also know their rights and responsibilities in relation to it.

South East Staffordshire HA's Information Assistant has, as one of his/her main duties, 'Data protection – to assist in registering the District's use of computers, maintenance of the register and training of District staff in all aspects of data protection'.

North Devon HA's Information Development Officer is expected to

> Assist the district's designated data protection officer in the administration of the district's data protection policy, ensuring all new systems are duly registered. In addition, provide advice to the district's computer users on all aspects of the 1984 Data Protection Act. Ensure all subject access enquiries are processed within the statutory time limit.

Thus some HIOs are expected to work closely with and take some of the responsibility of data protection officers. While every HIO will not be actually responsible for meeting the authority's requirements under the law, because HIOs are responsible for the production and dissemination of information, it is vitally important that they have a clear understanding of the implications of the Act for their own posts.

Conclusion

This survey of the role of HIOs is obviously limited in that only job descriptions were analysed and these job descriptions may not give a totally accurate picture of the role of the HIO. However, this author's contacts with HIOs makes the author believe that the roles identified above cover the main areas of work for HIOs. It is clear from the survey that HIOs play many different roles, depending on circumstances. Thus they are information providers to senior managers; information analysts when dealing with the needs of managers and clinicians; information gatherers in meeting the HA's statutory requirements for collecting certain kinds of data; systems evaluators and developers; line managers to some information personnel; trainers in the use of information and information systems; link persons in the flow of information within HAs; and occasionally librarians or data protection officers.

One aspect of the HIO's work is that a single person cannot possibly perform *all* the above roles effectively and further research could show to what extent HIOs have to prioritize their time and energies to meet conflicting needs. Further research could also examine the backgrounds of HIOs in terms of education and previous experience; the training needs of HIOs and how these are met; the promotion prospects of HIOs; the research role of the HIO and the extent to which HIOs see themselves as part of a new profession of healthcare information management professionals.

It is clear to this author that if we regard HIOs as information management professionals and examine the demand made on HIOs to demonstrate skills normally associated with other information professionals – systems analysts, information analysts, computing officers, librarians and information scientists – then information management itself may be described as 'the convergence of professions'(9).

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may have a number of HIO posts and the posts cited here do not imply that each HA has only one HIO.

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The difficulties and problems encountered in establishing a computer network in Poland CRT – POLKOM

Jacek Duch
DEC

Good morning ladies and gentlemen. Although my name appears in the conference programme I dared to ask a few of our colleagues and associates to present what we are going to talk about. I, like you, will be a listener. This is because first of all, we are an international corporation, and secondly, because the project we want to present to you was carried out thanks to international co-operation.

May I ask the following gentlemen to come up here, please: Mr Trebicki from the Centre for Radio and Telecommunication, who performs the duties of the Chief of the Polish Tele-information Post Office Network; Mr Izzak Grosz from Arel Computers & Software, Tel Aviv; and Mr David Robert, who is yet another representative of the Digital Equipment Company and is the marketing manager of the value added networks.

We would like to present the POLCOM Network, which will serve as an example of how, in terms of concrete solutions, the co-operation of Polish companies, the Digital Equipment Company and our partners, can lead to results such as yesterday's opening of the POLCOM Network.

I would like to ask Mr Robert to be first and to give a short introduction.

David Robert

I would like to begin our summary of the POLKOM service which was formally opened yesterday in Warsaw with an overview of networking and its role within business today. I am involved in activities right across Europe; last week I was in Portugal, Belgium and Holland and tomorrow I fly back to Belgium. It's interesting to compare and contrast the development of electronic mail and facsimile and business networking between the various companies within the European marketplace today. Whenever I look at networks now, I like to go back to history and this is actually a map. It's 400 years old, and it shows the major continents of Europe, Asia and Africa. In fact, in very small text, it's also got the names of the major countries: Poland, Russia, Turkey and Greece. It's quite interesting because England even in those days was a little island outside Europe, so maybe that's still the case today. But the key message in this picture is that in order to trade you needed to physically be near the silk routes, the spice routes, where those trading routes intersected within the Middle East and Central Europe. Today using networks you are freed of the constraints of space, you can trade virtually anywhere in the world, 24 hours a day, 7 days a week, in areas for example, within financial services.

I would like to move now to some of the benefits achieved by companies in the use of electronic mail and electronic data interchange within both western Europe and other parts of the world. So let me just take you through some of the major uses of networking: reducing the time to market for new products and services; improving logistics; the management of inventory and stock in companies and warehouses; the improvement of qualities whether it's cars, newspapers, or publications.

We have actually set up special focus groups within each particular industry segment. So, for example, in London we have a special team that focuses on the banking and insurance community and we have built networks for major banks such as Barclays Bank, Citibank, Bankers Trust – global trading networks for financial services. We have done the same within the retail segment for major distributors of newspapers and magazines.

Another example is manufacturing. You may not know that in the US Digital actually runs all the telecommunications for Kodak. The data service, the voice communication service – all that is managed under contract by Digital Corporation.

Let me just give you another example of an industry segment, the shipping community. Digital has been reactive with companies like the Company Generale Maritime in France, building trading nodes within the United States, Europe and the Far East within the research community. Digital is very committed to supporting universities and institutions and the High Energy Physics community. In fact those research networks are amongst the largest in the world today – the High Energy Physics Network alone has over 20,000 separate Digital networking nodes.

Finally, telecommunications. That is an area very close to my heart as I actually spent nearly 15 years working for British Telecom in the UK. Telecommunications is a key economic asset, it is a key component in the development of economic success and trade during the 1990s and we'll be hearing more about it from Mr Grosz a little later in this presentation.

Now what do we see as the main trends in networking in the 1990s? Well in this slide I have highlighted four key areas. In the first area we are talking about multi-vendor networking, linking the local area networks from Digital, DECNET, OSI networks, TCPIP, SNA networks, allowing companies using those different networks to trade effectively between their different operations. We are also talking about multi-media networks, linking the data, voice and image into a single facility. Again, in POLKOM, I think we have a good example where we have integrated the telegraph service, telex and image with facsimile into a single centre here in Warsaw.

To show you an example of multi-industry networks today we find that large industries, let's say the automobile industry, buys in chips from the electronics industry; they buy in plastic from the chemical industry. We need to build electronics and networks right across those various business groups from manufacturing through to the transportation companies, shipping companies, freight forwarders, the port authorities, and customs import/export. A complete cycle of electronic trade.

Now we have brought to Poland our experience in running networks in Europe and Jacek tells me that we will be bringing Digital's own corporate network here later this year so we will see another black curve from our other operations in Europe through into Warsaw.

Let me just give you a few of the elements we are talking about when we are thinking about network management today. We are talking about areas like fault reporting, inventory control, the configuration of the network. We would include elements like security management, the contracts involved in building that network and, finally, the administration itself – producing the bills for our customers, producing customer reports and also the future provisioning of customer access on that network.

Let me finish this short initial section with what I believe is the overall message for networking today. What I have done in this picture is to break the networks marketplace into six zones, if we take the first zone we have the desktop with just a single user using his personal computer or workstation, through to the local area network, team computing, through into the campus network – that could be a university campus or it could maybe be a health campus linking hospitals to doctors within a particular city or community. We then move into the corporate networks, then into the blue zone industry networks, and finally global networks. Now if I look at any country in the past those networks evolved their separate ways. What I spend much of my time doing today is talking with customers, finding ways to integrate their private networks through into the public networks – services like POLKOM, which we will be hearing about in the remainder of this presentation.

So I see a synergy, I see a very strong linkage between what we are doing here supporting the Polish PDT and the ways in which our customers – the businesses, the banks, the manufacturing companies – use networks in order to secure profitable growth for their businesses both within Poland and internationally. I'd like now to pass you to Mr Grosz from Arel who will give you a more detailed description of some of the activities that Digital and our partners have been involved with here in Poland during the last two years.

Mr Grosz

I am representing the managing director of Arel Computers and Software. It is an Israeli company which actually contracted the whole project and the network called POLKOM. I will provide the architectural view of the system installed and officially opened yesterday here in Warsaw.

Actually, POLKOM value-added network systems is located in David's slide and we are trying to interconnect all the private networks and all the other colours in David's slide to the entire world, and to provide to the public and to all manufacturers, industry and even private persons the capability to interconnect, at least from the technical point of view, to the entire world. The bottom line would be that somebody would have a PC at his home or have another type of computer at his industry or office, providing the capability to interconnect to other trading partners domestically in his country and internationally. To do that we need a computerized system and a different type of network, meaning that POLKOM is providing technical interfaces to different types of network, enabling the end-user to communicate with his own type of equipment without taking into consideration all the conversions from one type of network to another type of network. That is the main advantage of POLKOM.

The POLKOM system installed here is not necessarily an electronic mail system (although it is) and I would say that for the Polish communication and networking community it will provide a way to the international world via different types of networks. Many questions have been asked regarding the capability to interconnect to other trading partners or databases worldwide. POLKOM incorporating international CCITT standards like X for 100 provides, from a technical point of view, the capability to interconnect to any database in the entire world or to any other administration in the entire world provided there is a financial contract signed between the Polish PTT and any other administration or service provider. This means that for the Polish end-user, the businessman or a trading partner, or whoever it may be, his personal capability to interconnect with anybody in the entire world depends on financial agreements and conditions between the Polish PTT and the counterpart in the other part of the world, meaning, that it will go one step further than that. A PC user right now has the capability to send a fax message anywhere in the world because of his capability to interconnect via a local call to a computer located right now in Warsaw. The computer in Warsaw will take over and transmit the information to, probably a computer elsewhere in the world or directly to any other fax machine in the entire world, meaning that I have the capability to send fax messages 24 hours a day to the entire world.

So the electronic mail which has been discussed during the last couple of days is only one feature and not necessarily the most important one. The most important one is providing to the public the capability to interconnect via different types of network. Arel from Israel are very happy to give some help so that Poland becomes one of the members of the international communications capability in our century.

Mr Trebicki

Good morning ladies and gentlemen. My name is Trebicki and I am an employee of the Centre for Radio and Telecommunications in Warsaw. Thanks to the equipment installed and commissioned yesterday which, as the preceding speakers have already said, came from the Digital Equipment Company, while software, as well as parts of the hardware came from an Israeli company Arel, we can provide new services and improve those which we have been providing so far.

The new services, which were made available as from yesterday, can be divided into two categories. The first is the improvement of telegram orders by phone from every owner of a telephone set – that is, the so-called Telegram Centre. One had to dial 905 and so far it has been quite time-consuming because the telephonist has had to take the message from the subscriber, type it out and then pass the telegram to another room where another lady by the telegraph was punching the tape and sending it to the appropriate institution. It was quite time-consuming and monotonous,

The system launched yesterday has decisively improved this service. At present there is also a phonotelex, which means that the subscriber dials 905, the telephonist answers the call, but now directly inputs this into the terminal which is immediately linked via Ethernet cable to the POLKOM equipment. After the information is input, the operator presses a button on his/her terminal and at this moment a telegram is given a tariff, that is the words are counted and multiplied by the price of one word. And that's it. The telegram is sent according to the address.

This is one type of service which the public from the outside will not be able to use or for that matter observe. Another type of service is available to clients, telex and fax owners, as well as PC owners. The integration of those two networks took place. The subscribers to one network can switch in a simple, uncomplicated way into the other network. Consequently, the subscribers to the telex network, who have telexes can now send their messages not only to the telex subscribers, as it has been so far, but they can also send it to the subscribers with PCs and faxes. Please note, however, that for the sake of convenience we introduced two types of interface entries for the telex subscribers. There is so-called input entry only for PC owners who, after obtaining the connection with POLKOM transfer their message without any dialogue. The system checks their authorization for sending messages and they then send the message. They can send the same message to one or many addresses using the same connection.

This is one type of service related to sending messages from a PC. The other one is when, similarly to the previous example, the subscriber, by telephone, accesses POLKOM and having obtained the connection has a conversation with the system. That is, he can ask if there is any message for him in the PO Box. I should add that.., although I am in a bit of a hurry and that's why I am making it short,.. that the PC subscribers can have electronic PO Boxes. The information is sent to the PO Box and waits until the user collects it presenting an appropriate password. This is the second type of service.

The third type. Due to dynamic development of facsimile transmission and, I am sorry to acknowledge, due to the not particularly good telephone network about which everyone in this country is aware, facsimile retransmission began to operate. That is, facsimile subscribers in Warsaw, since this centre is at present in Warsaw, although subscribers from other cities can use it as well. For example subscribers from Warsaw, access the system, transfer their fax and the fax, according to the address given on the message, is transmitted by the operator to its addressee. And here, I think lies the great advantage of this system and an important service to our clients. Why is it so? I'll explain briefly. In principle, the international and home (telecommunication) networks are good; the worst is the municipal network. When a subscriber calls from Warsaw, for example from the Victoria Hotel to Frankfurt, then the part of the line from the Victoria Hotel to the Radiocommunciations Centre is responsible for the quality of this connection and on this line depends how quickly the fax will be sent; whether it will be sent at the rate of 2400 bits per second or 9600 bits. However, if the subscriber wants to get connected with us, then on the same part of the line the fax will be sent at the rate of 2400 bits because the network is not particularly good, but to Frankfurt it will be transmitted at the rate of 9600 bits/sec. The major share of costs falls on the international link where the information will be transmitted in a shorter period.

This, briefly, is the information that I wanted to impart. Thank you very much.

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Online in Poland

John Mortier
Office for Official Publications of the EC

According to the programme I am to speak to you about Online in Poland, but I am afraid that since this is my first visit to your country I will have to admit that my factual knowledge of this topic is somewhat limited, not about online, but online in Poland. Most of all I know I just learnt in this congress what I am absolutely certain of – going online here is possible. I know because we have a stand in the exhibition in the next room and we are online giving demonstrations of our databases. The other thing is that the online information that we provide is available to you and can be found.

It is my aim to explain something about the European Economic Communities policy concerning the distribution of online data and the structure of this distribution, then to explain what kind of information the institutions offer, and how to find it, Since the available time is rather short I will not confuse you with a mass of details; as I said before there is an exhibition and we are there at your disposal with online demonstrations of various databanks and related products.

Information, as you all know, is a vital element of economic activity, and the European Commission's involvement here covers a wide range of activities, amongst them the production of both printed and electronic information. This information is produced as first of all, our best-seller, the *Official Journal of the European Communities*, with the L series, C series and S series. Publications, single titles, reports and periodicals – all these are made available either in printed form, on microfiche or in electronic supports such as magnetic tapes, CD-ROMS, floppy discs and online. The aim of the European Commission is to have a dissemination policy that meets public and private needs by participating in promoting Europe to the general public by contributing to the creation and success of the big internal market; and by assuring the availability and free flow of vital European information — and, of course, to encourage the dissemination of EC-produced electronic information products.

Now how do we go about the dissemination, how is that organized by the Commission? First of all, through the Commission's own host organizations. At the moment there are 4 hosts. There is a commercial host, Eurobases; there is an experimental host, Echo, the European Commission host organization; there is Eurostat which is the statistical office of the European Commission; and there is Eur-Op which is the host of the office for Official Publications of the European Communities. Besides that the databases produced by the Commission and the institutions are disseminated through external hosts in the various countries, and there we can distinguish a host – somebody who buys our data, loads it onto his own system and disseminates it to his clients just as he received it from us without making any change to the data. Licensees are hosts that buy the data but incorporate that data in their own existing databases or change the data into other electronic products such as CD-ROM. And there is a third way — the commercial agents. Commercial agents to us function just in the same way as the sales offices my

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colleague Mr Serge Brack talked to you about yesterday. A commercial agent is somebody who in his own country looks after his clients. Those clients search in our databases, get user IDs and passwords from out hosts, but are invoiced through the commercial agents. The commercial agent promotes the databases and also supplies the user support, such as manuals in the language of the country where he is established, help-desk functions and, of course, training courses. The third channel is the European Commission Dissemination Centres, such as the European Documentation Centres, which are mostly established in universities; the EuroInfo Centres; and recently the rural Development and Promotion Centres.

Let us now look at the internal organization of the dissemination of the databases within the Commission. The EC Commission disseminates its databases either through DGIX, the Directorate General IX, through the commercial host Eurobases; through DG XIII, established in Luxembourg with the experimental host Echo; or through the Office for Official Publications with its own host Eur-Op. At the same time the Office for Official Publications serves as a link between Eurobases and Echo in as far as we manage the contracts for the external hosts, gateways and commercial agents; we invoice the client of the Commission-owned hosts, because Echo and Eurobases are not geared to do their own invoicing; and we produce our own products which are more situated in document delivery than that on our own host Eur-Op.

The next slide gives you an overview of the databases, the commercial databases which are available at this moment. On Eurobasis you will find Celex. Celex is a full text database and contains the whole of the EEC legislation. Scad is a bibliographical reference database; Info 92 is a database that gives the development in the building of the internal market. It is a database that is updated daily – sometimes even twice daily – each time that there are new applications in the member states related to the big internal market that, as you know, will come into being on 1 January 1993. Eurocon is the latest acquisition – it's a statistical database. Rapid is the database of the spokesman group with press releases; Eclas is the database of the central library of the Commission in Brussels and contains a score of documents and bibliographical references. Sesame is a database in the research and development field and contains research projects carried out by member states but financed by the Commission. Eurostat, with the macro-economical database Cronos, the external trade statistics database Comtext, and with the little sister of Cronos, Regio, a macro-economical database but in the regional field. Echo carries one commercial database, Tenders Electronic Daily. This database is situated on Echo because the database provides a fax and telex service which cannot at this moment be provided by Eurobases. Eur-op, with Abel, is a database containing the table of contents, and only the table of contents, of the *Official Journal of the European Communities L series*, but it gives selective access to these tables and it is linked with an optical archive. So you can search the database selectively, locate a document, order the document online, either by fax or normal mail; then the system goes into the archive, takes out the document and faxes it. So that is an overview of all that is available as commercial databases.

As I said before Echo is the European Commission Host Organization and is run by the Directorate for the Information Market which is Directorate General XIIIB. It is an experimental host. It's the host where databases are put to see whether they are viable, whether they are user friendly, whether they have a commercial value or not. Echo is situated in Luxembourg and it offers next to the database services, a whole range of other products aimed at improving the technical and human interface to online information. It does that not only through database services, but also through travelling workshops, training sessions in the various European states and by participating in exhibitions. It offers a variety of databases, more than 20 in total so I am not going to enumerate all of them. You can find an Echo brochure in the stand of Europy in the next room, but it offers databases in the area of user guidance and training. One of these databases is CCL–train which is a database where you can teach yourself the common command language for searching.

The DianeGuide* is a database of databases, listing all the databases that are produced and offered by European database producers; there is also a brokers guide.

Echo also offers databases in research and development, like Biorep or EABS which are abstracts. It offers databases in the field of the linguistic industry – the most known database there used by the industry all over Europe is Eurodicatem. It also offers databases in the field of industry and economy, and one of the most known, but unfortunately commercial databases (so it's not free of charge) is TED (Tenders Electronic Daily), and another one is ECU. Apart from that Echo has other products like video tapes and diskettes.

Eurobases is the commercial host. The administration help desk is situated in Brussels, and the mainframe is situated in Luxembourg. As a matter of fact all the mainframes are situated in Luxembourg which sometimes makes it a bit cumbersome to contact them, but it offers a unique selection of EC online information. Most of the databases are available in the nine languages. Eurostat is, as I said, in the statistical office of the EC and it offers statistical data on magnetic tapes, floppy disks and CD-ROMS. The online information is offered exclusively to end-users through external hosts one of them being Wefa, another being CSI. It does not offer online information to end-users itself because they are not geared for it, the only exception being the national statistical offices and such organizations with whom they have an exchange of statistical data. But they run a very efficient data shop, so if you have queries in a specific field you can address that query to the data shop and they send you a printout.

To finish, some more detailed information about some of the databases. I think one of the most known databases offered by Eurobases and offered by a score of hosts throughout Europe and even in the United States is Celex. Celex contains the complete Communities legislation. That is, the Treaties, the Agreements, the secondary legislation, the case law of the Court of Justice (full text), the verdicts of the Court of Justice and the conclusions of the Advocate General. It contains preparatory acts, it contains the parliamentary questions and, for the last year or so, the national provisions. The sources are the *Official Journal of the European Communities*, L series legislation, C series communications, the European Court of Justice reports and the Com documents. Available languages for the moment: French, English, German, Dutch, Italian, Greek and Danish. Spanish is in preparation and so is Portuguese. The coverage of the EC legislation is complete, ie from 1951 up to 1991. With that restriction the French version is the most complete one, followed by English and German. Greek and Danish are still being updated.

Scad is a bibliographical database and it contains bibliographical references to the main community instruments and the preparatory documents. It is a perfect complement to the Celex database as it also contains opinions and reports of the Economic and Social Committee, Council resolutions, Parliamentary reports and resolutions, opinions expressed by the European Parliament, Community legislation, some of the case law as far as it is published in the C version in the *Office Journal*, and of course bibliographical references to all the official publications and documents that are published by the European institutions. Furthermore, it contains (and that's a multi-lingual section) articles, bibliographical references and abstracts of articles in periodicals dealing with the activities of the institutions and fields that influence the development of the European Communities.

Eurostat has Comtext and External Trade Statistics, those are on Community external trade with 200 non-member countries, statistics on trade between the member countries and external trade statistics for the USA, Japan and Canada. Comtext is now also available on CD-ROM. The time span covered is 1976 to 1983 for the annual statistics, and from 1984 to today for the monthly statistics. The CD-ROM comes out on a monthly basis.

Cronos is a macro-economical database and contains general statistics, economic and financial statistics, statistics on energy and industry, agriculture and fisheries, social statistics, and external trade statistics. The last one I want to mention is a database that is rather useful for industry and for small and medium-sized enterprises. It is Tenders Electronic Daily, the electronic equivalent of the supplement of the *Official Journal* and it contains invitations to tender for public works supply and service contracts. These invitations to tender come from the 12 member states, they come from the associated states of the ACP countries, they come from non-associated states in as far as it concerns projects that are financed either by the European Development Fund or by the European Investment Bank. It contains invitations to tender from Non-EC countries so you will find invitations to tender from Sweden, Norway, Austria etc. And shortly it also contains invitations for projects in the framework of the far programme, so projects in Poland, Hungary etc.

* This is now *I'm Guide*

Electronic delivery of information

David Bawden
Department of Information Science
City University

I am going to speak on the general topic of electronic information, that is to say information provided in electronic form. I am going to give very much an overview presentation and a fairly brief presentation.

I would like you to bear two points especially in mind throughout my talk. Firstly to remember that electronic information is not merely a means by which information is transferred from one country or one area or one set of people to passive recipients somewhere else, rather it is part of a two way communication process. What Mr Zawislak yesterday called "the two-headed coin", and this is something which has been echoed by other speakers at this conference. Secondly, I want to emphasize throughout my presentation that it is the information and not the technology which is of primary importance. It is the quality and the appropriateness of information contained in electronic sources which makes them valuable and not the technology by which the information is delivered, however advanced and sophisticated that technology may be.

Let me first then attempt to answer briefly the question, what information is available in electronic form, or more accurately, what categories, what types of information are available in this way? I think that we can divide the information available into three main categories, and I shall speak about each of these in turn. I am calling these categories *factual information*, *reference information* and *informal information.*

By factual information or a factual information source I mean any sort of information which one can go to to find the answer to a question, the solution to a problem, the particular piece of information that one requires. Facts and figures if you like, text, words – information which satisfies our need and answers our questions at that time. Examples of this type of information are statistical and econometric data; legislation and standards; scientific and technical information; financial and commercial data – on companies and organizations and on people; sources of funding; information on news and current affairs; and environmental and social information.

Many databases are available; many sources of information are available in electronic form including this kind of factual information where we get the answers that we want immediately. Some examples have already been given by our last speaker of the EC databases. Factual databases and others will be given by succeeding speakers. That is our first category of information.

Our second category is what I call reference information, that is to say sources of information which do not directly give an answer but point us to where we may find the answer. For example bibliographic databases listing publications, books and reports; databases of databases, an example of which was given in the last presentation; lists of experts, people or organization consultants; information on

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research projects underway; also types of databases that one goes to and accesses and comes away, not with the answer to a question but with a list of useful sources which may themselves be printed volumes, reports, other databases or lists of sources where the answer may be found.

The third category I have called informal information. This is the kind of information source which is not often thought of as a database, and which indeed is not always included in formal listings of information sources. I mean systems such as electronic mail, bulletin boards and other systems where individuals and organizations can contact each other directly through the use of computers and networks and exchange information very directly. Mail systems and messaging systems – very important types of information systems and services which should not be forgotten, particularly important in promoting the two-way flow of information and communication which many speakers have emphasized at this conference. That is a brief summary of the three kinds of information available in electronic form, and many detailed examples will be given by other speakers and are on display in the exhibition.

How then can we actually obtain this information electronically? What are the technical means by which it is provided? There are essentially two ways: one is online services and the other is services whereby the information is provided directly for use on ones own computer system locally. Firstly I'll speak about online services of which we have had some examples in the last presentation and will be hearing of others later this afternoon.

By online searching I mean a system where the individual user obtains the information by contacting, through a telecommunications network, a so-called host system. That is to say, a computer centre on which a large number of information sources are maintained. Sometimes the information sources are provided themselves by the same organizations who maintain the host system as in the case of the European Communities information. In other cases the host system simply makes available databases from a wide variety of producers. In English these are sometimes termed supermarkets of databases, by analogy of going into a large shop and seeing lots of goods which aren't made by the owners of the shop. These systems are very convenient in a number of ways and very valuable. Their access mechanism and their structure of payment allow us simply to take the information that we need, as much as we need, at the time that we need it. We don't need to pay a lot of money to have access to information which we will only need occasionally, we pay for it purely as we use it and by having access to one or more large host systems we have access to a very large amount of information, as will be clear if, for example, you look at some of the listings of databases available on some of the host systems in the exhibition.

However we must bear in mind some drawbacks to this form of access. Firstly there is an absolute reliance on an adequate telecommunications network, to join the user to the host system which may be in the same country or elsewhere in the world. If telecommunications are a great problem then online access to information may well be frustrating and may even be impossible. Although the systems are convenient from the point of view of payment in that only what is used is charged for, nonetheless the charge in some cases may be quite expensive. A third point is that it is necessary for the user of these systems to become familiar with the searching system or retrieval system, that is to say the way in which the information is actually obtained from that computer system. This may be something of a problem if one needs only occasionally to access a number of different online information systems. Maintaining familiarity with the way in which the information is accessed may be a problem.

The alternative way in which one may obtain access to electronic information is by actually getting that information on one's own computer system, either in the form of magnetic media such as computer diskettes or optical media such as CD-ROMs. In the latter, of course, one would need to provide an optical disc drive as an adjunct to ones personal computer. Increasingly CD-ROMs are being used for publications and they are a very good publishing medium. They are able to store, relatively cheaply, very large amounts of information which may be in the form of text, graphics, pictures or what you will. They are a very useful form of obtaining information electronically since there is no reliance on telecommunications networks. The information is all available there and then on your own computer. In terms of payment, rather as with the purchase of a book or another conventional product, there is a one-off payment to obtain the information and no further payment with usage.

All of these ways of obtaining information electronically whether online from magnetic media locally or from optical media all allow effective, efficient and flexible ways of getting at the information via the software provided allowing the information to be retrieved, to be found. Also very many of these systems, particularly those dealing with, for example, economic data allow computer facilities for analysis, for summarization, for modelling, for displaying information – in general, for processing that information to make it of maximum use. In the case of online systems on networks these also allow very often the use of systems such as electronic mail and messaging and other communications systems.

If I may now just put in a few words about future prospects for the technology. We have had an example just this morning of how the capacity of information storage devices has increased greatly in recent years. I think that in the next few years we will see the emergence of systems able to handle multimedia information. That is to say, not merely storing text, words and numbers and simple graphics, but also moving pictures, video pictures and sound and other forms of information. These I think are now available on an experimental basis but it will not be long before they are generally available in information systems. That concludes the second part of my presentation which is a brief summary of the three important ways in which information may be obtained electronically, online, by magnetic media and by CD-ROM.

I would like to turn now to the third question which I posed at the outset of the talk, which is why is electronic information particularly valuable? Why would we wish to make use of information in this sort of format?

Firstly I think that there is simply a very wide range of information available in this way. Some of it is available uniquely in electronic form, only in electronic form. In other cases the online system or the database is the equivalent of an existing printed information source. Electronic information is also updated very regularly, much more regularly than is possible with an information source printed on paper, so it is particularly timely information. Computer retrieval systems provide easy, quick and precise access to information as it is required. Links can be provided as I have mentioned to computer routines for analysis, for summary, for evaluation or for processing, and links can be provided to two-way communication by electronic mail, messaging etc.

These then are the many advantages of electronic information, but let us bear in mind some caveats, some comments we must make about that. As I said at the beginning of this presentation I think it is very important to remember that it is the information content and not the technology which is important. The information is not better, not superior, because it comes out of a computer than if it were present on a printed page, or if you were told it by another person. The problems of quality, of accuracy, of reliability, of information, are just as much present in computerized electronic information services as they are in any other format. The problems of the completeness of information may even be magnified since, not only may some individual sources of information be incomplete in some respects but whole categories of information may not be represented or may not be fully represented in electronic form. Literary and cultural information for example is very much under-represented in electronic form. The fact that information is present in a computer system does not necessarily make it relevant to the problem in hand. It does not necessarily make it appropriate to the user, the individual or the organization who wish to make use of it, nor does the fact that the information is through a computer system of some form imply that it is necessarily a cost-effective method of obtaining that information. Mr Arendarski yesterday commented on the costs of the creation of his information resource, his database, and computerized information may or may not be cost effective for the problem in hand. So, I have tried there to set out some of what I think are the many advantages of electronic information, but to set against those some general points which we must always bear in mind when judging the appropriateness and the cost effectiveness of our information sources, whether they be computerized or not.

I hope that this overview that I have given in this short presentation will help you to set into some context the detailed examples of information sources which other speakers will present this afternoon and which you will be able to see in the exhibition. I think there are three points that it would be well to bear in mind when looking at these sort of systems and considering their usefulness to you. Firstly, technology has now given us in almost every case, an alternative way of finding information. There is usually a choice, a different way of getting what we want and therefore we must think about what is best for our particular needs. That choice should always be made by considering first and foremost the information content, the quality of the information and not the technology itself. Thirdly if I may reiterate a point which I made at the beginning, electronic information systems will only achieve their full value when they are used as part of a two-way communication process, not merely as a means by which information is transferred from one area to another, one country to another, one organization to another, but as part of a genuine two-way communication process.

Sources and uses of business information

Bob Norton
British Institute of Management

It is generally assumed by those collecting and producing information that the results of their labours will actually be used by someone.

To some jobs, of course, information is clearly central. Students and teachers base much of what they do on information. Libraries and archivists are guardians of information. Scholars and researchers, whether in academia or industry, spend most of their efforts in finding, testing and categorizing information. The work of police, lawyers and spies depends heavily on information.

But some managers are far from convinced of the importance of information to their day-by-day task. 'In an ivory tower, no doubt,' they might say, 'but not on the shop-floor. We have no time for such refinements down here at the coalface.'

But no manager, whatever his job, can get far without the use of information. Accountants and those who must use their figures provide the clearest example. Their work consists of establishing, processing, recording and transmitting information which can only justify itself as an input to management.

Engineers of all kinds also work with information, although the greater part of their effort is normally devoted more to using it than to obtaining it.

In the commercial field market information, or "market intelligence", has the clearest of niches. To know the reactions of potential purchasers both to our product (or service), to those of our competitors, and to those still to be developed, is accepted as essential knowledge in many fields.

But despite such clear examples, many managers remain unconvinced of the true relevance of information to what they do. In what way they use it, to make which specific decisions, and to what degree it influences those decisions, is at the least vague and uncertain.

Rice [4] has written:

> Managers face two basic problems in their decision-making efforts. First, they must decide which logic to use. Should they decide on the basis of economic theory, law, social good, immediate profit, religion, quantitative analysis, or something else? Second, they must find information appropriate to this logic, analyse that information, and reach a decision.
>
> It is suspected that many times managers may be led to reverse this sequence, starting with information available and putting it into a logic which can use that particular type of information. Information producers (e.g. government statisticians, journal editors, advertisers, newspaper reporters, etc.) presume that managers 'need' certain types of information in order to make decisions which the former presumes the latter will make, and will make on the basis of logic which the supplier presumes is the appropriate logic for the manager to use.

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> If managers base their decisions on available information rather than on pertinent, functional, appropriate information (regardless of the logic), it can lead to two problems. First, they are led to recognize only certain phenomena in the environment as 'problems'. Second, in solving these presumed problems on the basis of information and logic available, they are in danger of behaving in a way that has no effect on the problem which they are trying to solve.

As the speed of change becomes ever greater, and the marketplace ever wider and more competitive, we cannot avoid basic questions about the value of information to us, individually and corporately.

How, for example, does the training manager learn of new developments; the production manager become aware of new systems; the personnel manager of improved practices; the logistics manager of new storage technology or distribution methods; the computer manager of new machinery?

Sometimes, the questions can be more important than the answers. Questions have, in many organizations, been shelved for too long. They can prove too painful and embarrassing. To make progress, in this as in other fields, questions must be asked to generate first a climate, and then those answers, and only those answers, that are actually relevant to the needs that have been established.

Information in the product life cycle

Information can prove invaluable throughout the complete life cycle of any product or service.

Studies of the changing market success for new products have demonstrated that for every seven new product ideas, six will fall by the wayside[5]. The better the information at every stage, the less likely this, with its attendant waste of time and money and inevitable demoralization of all involved, is to happen.

The following paragraphs are, therefore, presented in product life cycle sequence. The same sequence is, of course, also applicable in a service context.

1. Generation of ideas

Information can support, sustain, generate, stimulate or terminate new product ideas. It can be argued that all products, processes and services are based on information that either existed and was retrieved or had to be generated.

The research by Booz Allen[5] shows that from a possible seven new ideas aimed at the generation of new market products, six will fail during the screening, analysis, R&D and testing phases.

Viable ideas, therefore, are at a premium, and so too must be successful techniques for their generation. Linking several facts or distinct pieces of data can stimulate or generate new thought processes. The technique of brainstorming relies on this to produce its results – so too now does the systematic use of information. Scanning databases of new products, market announcements and trade advertising can help in the creation of an atmosphere conducive to the generation of ideas.

In doing this, we will ask questions such as:

- What is the fundamental idea behind this?
- What benefits does it offer?
- How might the idea be applied in our own operation?
- Might it be combined with:
  - something we already do?
  - another new idea?
- Does it suggest further, untried approaches?

At this stage, the aim must always be to think positively; critical examination comes later.

2. Screening

Screening involves pitching our new ideas against company objectives and targets. Product strategy which information feeds must be compatible with overall corporate strategy. Identification and adoption of opportunities may require further support from information sources but it is already at this stage that the ideas mortality rate begins.

3. Market analysis

This is the classic area in which the use of information has been accepted, at least nominally, for many years.

Much data may be internally-produced by *ad hoc* market research. We will, of course, use the resources of information technology to capture, process and present this. There may, however, be other potential contributions from IT. It may be that the results of previous, or different, research can contribute to our current project, provided they are still accessible and can be presented in a relevant form.

More importantly, it is also possible that we can tap and use the resources of information publicly available through appropriate databases. Questions that may be answered might include:

- population analysis by age, sex, social class;
- spending power, employment, education, etc;
- demographic and economic trends;
- income and property distribution and ownership.

The results of surveys and studies of the marketplace undertaken by other organizations may be available from external databases.

Successful market analysis depends on the use of both *ad hoc*, internally-generated information and information that may be derived from external databases. In combining the two sources, we will find questions such as the following helpful:

- What is our primary market?
- What are the major segments of this market?
- What are the needs of this market?

- What kind of data is available on the various sub-groups and segments of this market?
- What is (a) known, (b) knowable about:
    - people who buy our product?
    - people who don't buy our product?
    - why people don't buy our product?
- Which further markets may be suitable for penetration?
- How are markets likely to change in the foreseeable future?
- How do our customers see us? What is our image?
- What discrepancies (if any) are there between the benefits we believe we bring to our customers and the benefits they perceive we bring them?
- Are our customers satisfied?
- What do we know about the effect of our provision of customer service?

4. Competitor and Collaborator Analysis

Having adopted an opportunity, we must develop a strategy for exploiting it. How does the organization proceed with plans for development and market entry?

Such an undertaking involves nothing less than a complete review and analysis of our competitors. We will need to obtain, sift and analyse full, up-to-date market data including trends, shares and balance sheet details of the major players.

The questions to be asked will include:

- Which companies lead in the market?
- Why?
- What new products/services are emerging?
- What is the situation in overseas markets?

If entry by merger, joint venture or acquisition seems worth considering, information on the history of possible partners becomes essential. In regard to each candidate, we must learn all we can about the company, its formation, growth and development, its current and future product range and its recent and projected sales turnover figures. Details of its markets, their analysis and projections are as important as records of financial performance. We must find out all we can about its share of the overall market, and form a picture of its growth prospects.

A wealth of company information is readily available. Company information, not only on our competitors but also on our customers and suppliers, includes:

- Who are company Z?
- What is their position in the market?
- What products do they have?
- What market share do they have?
- A profile of the recent developments of company Z?
- Its income statements for the last three years?
- Who are the senior executives?
- When does it file accounts?

- Who are its bankers?
- Who are its shareholders?
- Who are its subsidiaries?
- In which regions/countries does it/its subsidiaries operate?

Credit rating analyses with fully up-to-date supporting data, are supplied by several databases.

Databases are also now available that provide on-demand retrieval of press and trade articles that may have appeared on a given organization. Others offer instant availability of annual returns, balance sheets and other financial data.

5. R&D

Whichever of the above options are selected, successful development of our new product will probably call for information from both technical and business databases. Company and market databases can provide key insights in the analysis stage.

In determining the extent of the originality and the feasibility of a new product, databases of scientific research and patents will be important. Environmental and legal implications may be researched using law and technical databases.

The major element in R&D is, of course, the contribution of appropriate specialists, and whether these work in chemical, physical, biological, engineering or other fields, they should have available many relevant and helpful databases. The availability and suitability of materials, for example, can often be ascertained through a combination of news and technical databases.

6. Testing

We can identify potential key customers or suitable companies to test the product development by searching databases for pertinent mailings by region, postcode, product, SIC code, turnover, number of employees, etc.

7. Introduction

Product application and introduction is more than ensuring the product fits company objectives. We will need to verify its commercial viability, and assess its market potential within the frameworks of current competition and present economic environment. This will involve a mix of internal analysis and information input. Again product, company, industry and market research databases can give invaluable input to the forecasting model.

> Once the product has been determined to be marketable and manufacturing processes have been developed, online information can facilitate the development of a successful marketing strategy for product introduction[6].

The “4 Ps” — product, price, place and promotion — will all need careful planning.

Databases can again provide much help with forecasting the likely market share and position, helping to assess uniqueness compared to other products, selecting appropriate distribution channels, packaging, brand-naming, and promotional techniques. They can provide us not only with ideas for strategies and techniques on market positioning and distribution but also on brand names, pricing and promotion techniques. Advertising and management databases can prove a boon in the generation of fresh ideas and untried approaches.

8. Production

Production control has been a classic area for the application of the techniques of information technology. Many systems were developed in the mid-sixties, during the first great period of electronic expansion. One large engineering company designated its system with the acronym MAGPIE, which quickly became understood far and wide to stand for "Machine for the Automatic Generation of Paper Instead of Engines". Sadly, this sort of comment was all-too-often justified.

By their nature, production control systems use internally-generated data, and most now operate in real time. This is a specialist area with a longer history than most, in which the development of a system calls for wide and unbiased knowledge of what is currently available.

9. Logistics

"Logistics" has become the word used to describe the functions of distribution: warehousing, stock control and transport. Some logistics systems also incorporate production and raw material control, thus embracing the total "supply chain".

The fully panoply of techniques of information technology has, during the past few years, been deployed in this area, with enormous benefits. Stock holdings have been reduced, and the efficiency of distribution has been revolutionized. These achievements are seen at their peak in the system of "kanban" or "just-in-time" manufacturing, in which the most accurate systems enable production to continue smoothly with little or no raw, part-finished work-in-progress or completed stock holding.

The information input for such systems is, again, largely internally-generated, much now at the point of sale, where bar-coding of goods enables direct, real-time input of data.

10. Product growth and maturity

Obsolescence is now the name of the game — what was once a speciality, original, innovative and premium-priced all too rapidly becomes an off-the-shelf commodity. What is lost as a product becomes established may, however, be regained by tracking competitive market developments in those same databases used for development. Monitoring competitive research and market launches is as much a feature of maintenance as innovation.

Further distribution channels can be quickly exploited with directory databases which produce address labels for mailshots. We may find innovative promotion techniques and update our skills, ideas or methods through the creative use of management and marketing databases.

Two important aspects will need attention throughout the life cycle of any product: overall management control, and the education and training of staff.

11. Overall Management Control

The market information essential to effective management of the product life cycle can provide us with key decision-making data. Just how we manage, how effectively and efficiently, will depend on access to a different kind of data.

Information sources are now accessible on the techniques and principles of management practice. Theories of motivation, ideas on sales techniques, approaches to leadership are all available from up-to-date, online sources.

Such databases are designed to help managers solve day-by-day problems and learn new ways to manage. The key to their effective use is, once again, correct definition of the need — asking the right questions before we start looking at possible answers. Only in this way can we expect to find the specific information relevant to our actual set of circumstances.

Examples to the kind of questions that can be approached by reference to appropriate databases might include:

- What is "kanban"? Case studies of its implementation?
- What is "just-in-time"? What technological support might it need?
- What are the advantages and pitfalls of quality circles?
- The best practices for successful team building?
- Case studies on changing corporate culture?
- Typical retirement planning policies?
- Typical benefit packages or long-service awards?
- Systems of performance appraisal?
- What is "intrapreneurship"? Will it benefit my organization?
- Case studies on successful takeovers and organizational integration?

12. Education and Training

Several databases specifically designed to aid management development and training are now available. They include coverage of short courses and audio-visual materials designed to provide a practical, problem-solving approach to such topics as:

- strategies for motivation and leadership;
- techniques of time management;
- approaches to improving customer service;
- the most effective techniques for presentation and public speaking;
- the techniques of negotiation;
- improving management performance;
- assertiveness.

In all these cases, as always, it is essential to remember that to get the best from the information available, we must ask the right questions. The more the options and the greater the volume of available data, the easier it is to take a wrong road, or get bogged down in the sheer volume.

Checklist

1. In what areas of its operation does your organization currently use information extensively? Does it use it efficiently and effectively?
2. In what areas might your organization benefit from more extensive use of information? What information might it use, and to obtain what benefits?
3. Is your information organized as a resource for tapping when required? Do all input to, and can all draw, on this resource?

Sources and uses of environmental, land use and development information

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Introduction

The major purpose of the EuroInfo Conference is to discuss information resource management. Members of the European Commission and Polish business and industry managers have expressed the need for improved information management in Poland. Improved information resource management is essential to aid quick and efficient reform and recovery of the Polish economy. Future economic growth and sustainable economic development for Poland is dependent on the efficient use and management of vast amounts of information.

Papers which discuss sources of information, methodologies and models for managing information and uses of information to build international business and trade relations for Poland have been presented. However, the assumption made when discussing information management systems is that the necessary systems and infrastructure needed to support the management of large amounts of, electronically stored and managed information, currently exists in Poland. For example, one must assume that adequate support systems like telecommunications, computer access, energy supplies and work environments exist to support the information management functions before one can discuss sources of information and models for managing information. One simply needs to try and make a direct telephone call from a western European country to Poland to find out that the telecommunications systems for example, in Poland, need vast improvement.

The objective of this paper is threefold. First, to introduce the need for strategic business and facilities plans, which are essential for planning facilities and infrastructure to support information management systems. Secondly, to discuss the need for multi-disciplined teams of real estate, facility and information resource managers to plan cost effective facilities and infrastructure improvements. Finally, to describe sources and uses of environmental, land use and development information which can be useful to assist facility and infrastructure planners who want to avoid techno-starvation.

New and improved infrastructures including telecommunication systems, electrical energy supply, "smart" office facilities and general utility improvements are essential to support the existing and new information management systems needed in Poland. The basic assumption is that in an open market economy business investment and management decisions are greatly dependent on the access and the management of vast amounts of information. In order for Polish business managers to become the sort of profit maximizers, whose behaviour is extolled in introductory economics text books,

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new and improved information management systems and infrastructure support are needed.

Polish government and business needs to prepare strategic business and facilities plans with well coordinated multi-disciplined management teams including real estate, facilities, and information managers. These teams and their plans are necessary to guarantee that information resource managers will have access to the systems and support infrastructure (hardware) needed to efficiently manage information resources. Both information management systems and the infrastructure support is needed to guide future economic growth and sustained economic development in Poland. Clearly, new information systems will require urban facilities and infrastructures which are not currently adequate in Poland. The Polish economy suffers greatly from Techno-starvation (a lack of information access, management systems and infrastructure to support the systems). Planning for new and updated information systems and the necessary support facilities is needed. Environmental, land use and development information is essential to planning facilities, and to infrastructures necessary to support information management systems.

Techno-starvation in Poland and elsewhere

Key Question #1

How many of you present today, currently have access to reliable information management systems including telecommunications, computer resources and work environments that integrate telecommunications and information management systems with adequate energy supplies and training facilities?

Generally the answer to this question in Poland and elsewhere is that adequate systems and facilities do not exist. The existing facilities lack the information management systems, integrated telecommunications facilities and infrastructure necessary to manage information resources quickly and efficiently. Three management disciplines having the greatest impact on the workplace quality, flexibility and occupancy cost control are real estate, facilities and technology. Unfortunately, in many businesses these management disciplines act like separate groups with resulting, unnecessary crises between them. For example, real estate, which has traditionally been closest to senior management and the corporate business plan, presents opportunities to close a great deal. The facility management department gets a belated notice regarding a new facility. Information resource managers might be kept out of the picture until consultants are brought on board during the space planning process. The resulting renovation cost for telecommunication and electrical needs alone will often exceed any amount that was saved during the initial real estate deal.

This does not even address the expenditures to meet workstation and training facility standards that will not work with the building's mullion, column and curtain wall-to-core spacings.

To end these facility and infrastructure related financial catastrophes, government and business must include the information resource managers and their needs in facilities planning to insure cost effective access to information resources and the tools needed to manage the information. These managers must also be included in the strategic business and facilities planning to avoid future techno-starvation.

Changing information management technology greatly affects the office and infrastructure facilities of the future in Poland and elsewhere. According to Peter Valentine, owner of Comsul Ltd., a San Francisco-based international telecommunications consulting company, 'As the number of computer terminals increases so does the number of printers and other peripherals.' Comsul, while consulting for a Wall Street investment banking firm in the United States planning to improve its information systems, discovered that it was using 35 percent of a large office building's floor space while consuming 85 percent of its power supply. In the end, the tenants had to revamp the building's power access and distribution capabilities at a cost of $35 per square foot, just for the required government and utility permits, cable, electrical mains and junction box installations. Techno-starvation raises a slew of facilities, location, design, construction, leasing and financing issues for private business and government dependent on information management systems.

Knowledge of environmental, land use and development information can help prevent techno-starvation for building facilities planners and information resource managers in the future. Facilities planning where telecommunication integration and a number of information systems are needed requires large amounts of interconnected information such as the following:

- Knowledge of availability of existing real estate (buildings or development sites)
- Knowledge of existing urban services and resources (electrical power, telecommunications, roads and rails, police and fire protection, water, sewer,)
- Knowledge of environmental hazards and land use policies, regulations and permit requirements
- Knowledge of land and building economics, financing, leasing incentives, and market trends
- Knowledge of architectural, planning, engineering and construction standards.

We have learned that vast sources of information exist and that the majority of the information can be accessed electronically from online sources with telecommunication technologies including telephones, computer modems (computer phone connections), direct line connections, fax machines and exchange of magnetic discs. Information stored and delivered electronically has become the most widely used management tool in the information industry. Advanced telecommunications integration and electronic information systems are due to more than quadruple in the western world in the 1990s. To enable Poland to take part in the process of European integration, consolidate the reforms that have been set in train, receive assistance in transition to a market economy, cope with the social consequences of structural adjustment and create a climate propitious to the growth of trade and investment, the strategic planning and development of information management systems and associated infrastructure is essential.

Envision the future: strategic facilities planning

With advanced telecommunication integration and the number of information systems due to quadruple in the 1990s the office of the future and the necessary infrastructure to support them is arriving faster than the buildings and utilities of today can support. Information systems (the 4th Resource) are having a direct impact on urban infrastructure facility master plans. Poland's plan for the future must envisage urban facilities and infrastructure needed to support the service demands of the information industry. In order to meet the future service demands of the information industry business and government, decision makers need integrated strategic business and facility plans.

A strategic plan is most useful not for what it tells you to do but in that it informs you of your options, so that you are not "blindsided" by an easily-predicted occurrence. Once completed, the strategic business and facilities plan charts a course for the business as a whole, establishing goals which can be met and determining measures by which progress can be noted.

Facilities strategic planning is a multi-disciplined activity involving a series of highly systematized, interactive events which occur throughout the life of an organization. Strategic facilities planning is an activity based in the future. These plans are used to methodically analyze, evaluate, acquire and deploy resources necessary to satisfy facility demands and infrastructure requirements.

These action plans directly support an organization's business plan, goals and missions by integrating the principles of business management and administration with the facilities and infrastructure support needed to realize the business purpose. At any level, corporate planning must always consider components: the corporate purpose, the finances. people, *places in which the purpose is to be fulfilled and the facilities and infrastructure needed to support the purpose*. In this context, we are examining the role of a facilities plan which supports the corporate strategic plan. The strategic facilities plan takes on a special role in Poland. In Poland a business dependent on information management technology must consider major building construction or rehabilitation to prepare facilities and infrastructure to support information resource management needs. In strategic facilities planning, we are interested in the facilities of the future: how much physical space is required; of what kind; how will it be supplied; how will technological changes impact facilities; what are the infrastructure facilities capabilities and future capabilities; and what are the operational implications of facilities locations?

Key Question #2

Who needs environmental, land use and development information?

Government and business facilities managers planning buildings to house the new information systems and the necessary infrastructure to support them, need environmental, land use and development information. This information is needed in the preparation of a multi-disciplined, highly systemized strategic facilities plan. This information is essential to guarantee that the necessary facilities and infrastructure needed to support the business purpose are available and will be adequate to meet future business demands. Environmental, land use and development information is needed to locate facilities where infrastructure support exists or is planned. The information can be used to project the costs of facility improvements, protect business investment from environmental hazards, land use changes and avoids unexpected costly permit requirements. Clearly, the most critical step in a strategic business and facilities planning is the carefully articulated facilities project plan within the real estate market. More simply stated: where will business and government locate information management system facilities and support infrastructures? What urban infrastructure is needed to support the information management systems? Are they available now and in the quantities needed?

What new services will be forthcoming and will they meet the future demands of the information industry?

It is at this juncture that the information management task and the hardware needed to accomplish it become real. Precious financial resources are put at risk and there are enormous opportunities to realize operational, financial and management benefits which could impact the management of information positively. But the converse is also true. Unsophisticated and ill-informed real estate project management, facilities and infrastructure planning can impose horrendous economic and operational penalties for years to come. For example, assume a large financial services company which plans to provide consumer credit services on a national basis is looking for a location in Warsaw, Poland. Since 90 percent of the staff members are customer service clericals utilizing video display terminals, a high priority is placed on technology support. The business premise is that without technology support a reasonable return on investment would not be realized. The strategic facilities planning staff has specified a full range of high-tech design features including raised floors for communication cable management, parabolic lighting, sound masking and highly flexible open plan furniture. The building would also feature an uninterruptible power system to guard against computer interruptions and integrated telecommunications for access to international information sources.

Where can these facilities and the necessary infrastructure to support them be found in Warsaw? Without an exhaustive search of the market one can assume such facilities are not currently available in Warsaw and that new facilities must be built or existing buildings must be redeveloped to include the necessary improvements. Without the facility improvements (the hardware) the planned consumer credit services company cannot meet the goals and objectives defined in the strategic business and facilities plan. The company may chose to make the necessary investment in facilities or it may chose not to locate in Warsaw or anywhere else in Poland unless facilities can be found. In either event detailed environmental, land use and development information can be used by the business and facilities planners to make the business decision to invest in facilities or not. Without this information the business could make enormous investments in business and facilities planning and design only to find that the chosen building or site has unknown environmental hazards or the necessary permits for land use cannot be secured or the infrastructure facilities are inadequate to meet the business demands currently or in the future.

Planners, architects, engineers and building construction companies who analyze and present building locations and designs to accommodate future information systems, and their users need environmental, land use and development information.

Government agencies responsible for coordinating environmental hazards management, land development, physical planning, transportation and economic development in general need environmental, land use and development information. Utility companies planning new facilities to meet current and future service demands also need this information.

Sources of environmental, land use and development information

Government, universities and research institutes, banks, utility companies, real estate companies, planners, architects, engineers, private developers and construction companies are the major sources of this information.

Government sources of information are presented in various levels of detail based on the governments jurisdictional limits. Sources of government information are generally divided into local, state, federal, regional, national, international and global levels. Government agencies specifically responsible for physical planning, environmental hazards management, utility services, economic development and land use planning are the best sources. Government is also the source of information for development regulations and construction standards, as well as permit requirements.

University and research institutes have specific colleges or programs that specialize in land planning, environmental sciences, geography, economics, engineering, architecture and sociology. These sources of information seem to be more theoretical. But very often do a good job of providing understanding of larger long term issues facing future facilities and infrastructure planning. These information sources are not as specific as government sources and have limited usefulness in strategic facilities planning.

Banks and real estate development companies are generally in the business of financing facilities and infrastructure developments and locating and securing sites for development. This information source is excellent for getting a good picture of the real estate market, land economics, urban facilities and infrastructure development trends. Banks and financial institutions usually have specific divisions or departments which deal in the real estate field. Larger institutions will also have specific staff involved in the funding programs for large real estate developments including roads, housing, factories and utility facilities. Generally these sources of information have detailed data in the form of economic feasibility studies and statistical analyses which are very helpful for business and facilities planners.

Planners, architects, engineers and construction companies are great sources of information for physical planning. They can give good estimates of construction costs and generally have good information about the existing and planned utilities capabilities. Generally these professionals have a good understanding of the labour markets for construction trades. They also know specific building and construction standards as well as the suppliers and costs of materials. These sources can provide physical planning services that bring the various pieces of development information together into an illustrated facilities improvement or development plan.

Measurements are the information

All environmental, land use and development information is collected mostly in terms of measurements. Measurements are the information. Measurements have many qualities including the ability to prove effectiveness, contribute to corporate results, determine which service areas need improvement, support budget allocation requests and decisions and help facilities planners and business managers make individual or team decisions.

Environmental information includes measurements of geology, soils, flora and fauna, topography, water, air, land, natural and built environments, and the general health and hazards of the physical environment. These measurements include health standards and regulations of various requirements to comply with the set standards. They also include location analysis of various sites and buildings where environmental clean up may be required to comply with new measurements and standards. Methods for environmental quality measurements will be included in this information as well.

Land use information includes measurements of land areas. Past, present and future uses of land are also provided. Percentages of land in specific uses such as agriculture, parks, factories, roads, electrical utilities, sewer plants, and water facilities are included. Land use information may also include demographics such as population size, income and travel patterns. This information also includes utility service capacities and plans for improvements. This information is very important to facilities planners who are looking for sites to locate future facilities with specific utility demands such as integrated telecommunications and electrical energy supplies. Land use plans will also include long range programs for utility service extensions necessary to support the land uses planned for a particular area. Generally land use plans will include goals and objectives for the future development and use of land. Methods for measuring compliance with policies, goals and standards will also be provided. Land use regulations and design standards are included in this information.

Development information includes the measurement of real estate market prices and past and present development trends. This information brings environmental and land use information together in the form of specific real development and current proposals. It also encompasses the financial resource information including economic development patterns and funding sources needed for concrete project proposals. This information also includes design and construction plans for construction of facilities complete with engineering specifications, government standards and necessary permits needed for construction of rehabilitation of facilities.

What does environmental, land use and development information look like? It comes in the form of written text, tables, graphs, maps, plans and blueprints. The information is stored on paper, plastic, film, magnetic tape and in computers as large electronic databases.

Uses of environmental, land use and development information

Environmental information can be used to avoid environmental hazards. This information can be used in the design of new facilities to minimize their impact on the natural environment and to avoid the impact of the natural environment on new facilities. This information is useful to a government charged with setting standards and regulating the quality of the air, water and land. Environmental information is needed by business and facilities planners to inform them of the sensitivity of certain sites to local environmental hazards. Facilities planners can use this information to gain knowledge of past uses of sites and the potential for land, water or air pollution and clean up responsibilities. Information resource managers can use this information to ensure that facilities and infrastructure systems needed to support their business are planned in accordance with environmental standards and regulations thus insuring sustainable development and long term operation.

Land use information is very important to government and business strategic planners. This information is used to coordinate the need for facilities with the infrastructure necessary to support them. Land use planning is critical to economic growth and sustainable economic development. The Government uses this information to direct economic development to specific geographic areas where necessary infrastructure exists or can be provided. Utility companies use this information to plan new facilities to meet future service demands. Planners, architects, engineers and construction businesses use this information to locate building sites, and to design and construct new buildings.

Information resource managers who are dependent on telecommunications integration and a large number of electronic information systems need this information when preparing strategic business and facilities plans. They can also use this information to advise utility companies and governments as to the needs for future infrastructures essential to support their facility needs. Land use information can be used by facilities planners to locate development sites to serve business and industry. This information is also used generally to make decisions on clustering various types of land use which are compatible and dependent on each other.

Information resource managers need this information to help plan future facilities for information management systems dependent on integrated telecommunications and energy supplies. Knowledge of this information is helpful to assist business facilities planning that is compatible with government plans. This information can also provide a general understanding of the land development policies that support land development regulations and construction standards. Knowledge of construction and development standards along with permit requirements are very useful to facilities planners in estimating construction costs. Land use information is also useful to understanding plans for the future development and use of land being considered as a location and surrounding current and future land uses. This understanding will help planners in selecting locations that provide financial benefits and long tern operational benefits. This information is necessary for long range planning needed to avoid techno-starvation.

Development information is used by government and business planners for viewing the whole picture of current development activities. Development information can be used in the first stages of strategic facilities planning as a bench mark for understanding current trends. This information is useful for developing knowledge of the steps needed to proceed with development of new or rehabilitated facilities. Because development information is generally presented in the form of built or final plans it provides a synopsis of the past and current real estate market trends. Development information can be very useful for planners looking for new facilities of development currently under construction or recently built. These developments may meet their particular needs as built or with minor adjustments. This information is very useful to managers looking for buildings to house information management systems because it presents what the market currently has to offer. This information is also used to locate existing buildings or sites for construction of new buildings where facilities are planned but not yet built.

Summary

Information resource management is critical to the future of Poland's economic growth and sustained economic development. Access to and management of vast amounts of information will assist Poland in making a quick and efficient transition to an open market economy. Information stored and delivered electronically has become the most widely used management tool in the information industry. Advanced telecommunications integration and electronic information systems are due to more than quadruple in the western world. To enable Poland to take part in the process of European integration, consolidate the reforms that have been set in train, receive assistance in transition to a market economy, cope with the social consequences of structural adjustment and create a climate propitious to the growth of trade and investment, the strategic planning and development of information management systems and associated infrastructures is essential.

The necessary systems and infrastructures needed to support the management of large amounts of electronically stored and managed information do not currently exist in Poland. New and improved facilities and infrastructures including telecommunications systems, electrical energy supply, "smart" office facilities and general utility improvements are essential to support the existing and new information management systems needed. Polish government and business needs multi-discipline teams of real estate, facility and information resource managers to prepare strategic business plans to guarantee cost effective development support infrastructures (hardware) needed to manage vast amounts of information.

Environmental, land use and development information is essential to planning new information management facilities and infrastructures to project the costs of improvements, protect business investment from environmental hazards and avoid techno-starvation. As more technology and support systems are needed in Poland, information resource managers and planners must become new users of environmental, land use and development information. They will need this information to assist in planning future information resource management facilities where infrastructure demands such as telecommunications integration, electrical energy supplies and smart offices, must be met. With the use of environmental, land use and development information in strategic business and facilities planning, real estate, facility and information resource managers will avoid unsophisticated and ill-informed real estate development projects and the associated operational costs for years to come.

Strategic business and facilities plans prepared by multi-discipline teams assisted by knowledge of environmental, land use and development information will realize operational, financial and management benefits which will impact the management of information resources positively.

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The Pesel system

Edmund Lobocki
Trax-IBM

Today, I have the honour of presenting some information about the concept and the present state of the implementation of a project called the Home Computer Network of the Governmental Computer Centre.

The Governmental Computer Centre is an institution which was established to introduce the National Census. Now a few words about the information gathered by the RCI (The Governmental Computer Centre). This issue has recurred a few times during our meeting here, so I dare say a few words regarding the type of data gathered by Pesel are required. It is the basic information about every citizen such as name, surname, date and place of birth, mother's and father's surnames, the present surname and if there were any changes, then the previous surnames. That's all that is gathered in Pesel. Consequently, this is data which can be found on any identity card. A citizen so described is given a unique number. This number is used later for various purposes such as issuing an identity card or a passport. So in fact the system is created purely for purposes of registration.

RCI has at its disposal computer communication centres and territorial databases which practically cover the whole country. Both computer communication centres, as well as the territorial databases, are usually situated in the local administration offices. As a result, RCI has at its disposal telecommunication links with every province.

The system used so far consists of a CPU and a few hundred terminals distributed all over the country. For a few years territorial databases were being installed on RIAD computers produced by ELVRO. This is an IBM clone resembling series 360 and 370. However, last year when the Comecon limitations had been relaxed this institution faced the problem of choosing a new development concept and the necessity of introducing major changes.

The following basic assumptions were then accepted. One of the major assumptions was that the implementation of the concept would be carried out with the assistance of the most modern computers and information technology. Furthermore, the possibility of the implementation of a networked database was accepted. Next came co-operation with other computer networks, the maximum security of the database and the introduction of electronic mail into this network. Finally, it had been assumed that the Census might be used to create other systems such as taxation or insurance systems, systems holding records of land, buildings or vehicles.

After a detailed analysis was made in the middle of last year (1990), which took into account the state of knowledge at that time, regarding the possibilities of purchasing equipment and software in the West, the decision was taken to obtain IBM hardware, more specifically, the AS 400. For those of you who are more familiar with the IBM I would like to add that model B 35 was selected.

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At present the implementation is progressing as follows. Four territorial databases have been established. They are located in the following towns: Szczecin, Czestochowa, Lodz and Zielona Gora. A territorial database covers more than the area of a province. On average it serves for registration of 2.5 million people which means that on average it serves three or four provinces. We can say that the completion of this stage will result in covering about 20% of the country's territory. Let me show you a drawing of this network which I talk about in some detail.

Looking at this drawing you can distinguish that there are three layers of the network. At the very top you can see a fragment of the network installed in the Governmental Computer Centre, which is situated in Pawinskiego Street in Warsaw. This part of the network consists of two AS 400 computers connected in such a way that the computer on the left-hand side of the drawing is intended to serve Warsaw, that is, it will serve the central administration. The second computer serves the purpose of maintaining communication between the Governmental Computer Centre and the rest of the country. On the right-hand side you can see a Siemens computer on which for many years the Census database has been stored. This computer connected with the computer AS 400, the one which I called, the communications computer, gives the possibility of accessing citizens' records from each terminal connected to this network.

On the next level below, those computers are connected with the Governmental Computer Centre via the lines leased from the Post Office and they will include this part of the database which refers to the records of the inhabitants living in the area covered by this territorial database. Below those 4 computers an example of the development of the network for each province is shown. Only the fragment concerning Zielona Gora is illustrated, but a similar set-up refers to the remaining provinces Szczecin, Czestochowa and Lodz.

We can clearly see that with regard to the territorial database in Zielona Gora it will serve the following provinces – Jeleniogorskie, Legnickie, Leszczynskie and Zielona Gora itself. There is another level below this drawing which refers to the smallest unit of the state administration, that is, regions and districts. Companies such as ZUS (National Insurance Office), some large banks and large industrial companies also expressed a wish to join this network. At present local computer networks are installed at the local administration offices. Additionally, designs are being developed to computerize offices of the municipal administration networks.

Now a few words about the software installed. The main part of the software will consist of the Census system. It was assumed that the programs will be written in SQL and C languages. With regard to the commissioning of the package we plan to complete the work on the present version by the end of July. Later on this package will have to be tested and this will last three to four months. The next package installed in this network is an IBM package called Office. It is a very advanced electronic mail system which includes a calendar, wordprocessor and a facility to archive documents.

Finally, a few words about the stage the present installation has reached. At the moment, the installation of territorial databases is close to completion and the connections are established between the Governmental Computer Centre in Warsaw and each territorial database. Furthermore, the territorial databases are being connected with the provinces they serve. Trial links are also established with regional and communal administration units. That's all I wanted to say. Thank you very much.

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The world economy: business, politics and culture

Wlodzimierz Gogolek
WIP – Dialog

Frankly, I feel as if I have been called up to the blackboard, like a student or even a pupil, because a few days ago during the Poznan Trade Fair I was invited by the British Foundation to make a presentation by this blackboard. As a broker for Dialog, an American Information Service I couldn't agree without obtaining permission from my bosses in Pal Alto. It is "a few" kilometres away from here and I needed to obtain their permission.

And here arises a problem about which a lot was said today, that is, that of communication and transmission of information. I must say, that I was very surprised at the efficiency with which it progressed thanks to our home telecoms. Because connecting an ordinary PC to the Dialog network, which begins in London, resulted in a very efficient transmission of the electronic post between Pal Alto, which is near San Francisco, (and Poland) in both directions and I was granted permission to speak today.

There is, of course, too little time to present a thorough analysis of Dialog, although I would like very much to do so because personally I am fascinated by this information system. I did not contribute to its construction, however. The enormous knowledge which was gathered there by thousands of people is worth popularizing and I would like to say a few words about it.

The reason behind my introduction is that I wanted to draw your attention to three issues. Firstly, abiding by the law, which in Poland – especially among the computer scientists – has a long way to go. Secondly, the desperate condition of our telecoms, which turns out to be not too bad if one has good hardware and software. Thirdly, a general characterization of our activities in the field of computer science and information technology.

Pal Alto is a small town near San Francisco with about 100,000 inhabitants. It is a synonym of perfection in the field of information technology because who hasn't heard about the Silicon Valley, which is situated just there. This synonym of perfection is one side of the coin. It means enormous potential in the area of information technology, enormous powers of computers to make calculations. A lot has been said about it. On the other hand there are many needs.

Unfortunately, there is a gap between potential and needs. Computer users have an enormous number of needs which do not always go together with the performance of the equipment. I wanted to illustrate it using the letter V. On the one hand there is an enormous potential, I won't mention all the equipment, the software and so on, and on the other hand there are needs. An average user of this enormous amount of information is not able to utilize all that this potential can give.

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Fortunately, a bridge is now being built joining this potential with the needs which we, the users, represent. I simplified this bridge to three elements. These are software, hardware and information services which I've underlined. The existence of the bridge joining the apexes of the letter V depends on the constructors of the software, hardware and information services. I won't talk about the first two elements. However, I wanted to draw your attention to the enormous importance of information services including Dialog.

Dialog's merit does not lie in gathering information. Its merit lies in the fact that it managed to concentrate so much knowledge in one place. This contradicts what Mr Woody Horton said a few hours ago and I will willingly prove my point if it's required. Because knowledge about knowledge *is* gathered in Dialog in detail.

Dialog comprises about 400 databases and each of these databases is the size of Reuters and Reuters has a very detailed database concerning almost all spheres of activity. (For example) there is Dun & Bradstreet, whose representatives are in this conference room. And this is just one of 400 databases. Consequently, the amount of knowledge concentrated in one place is incredibly great.

There is also useful information for the users. This is illustrated in great simplification in the picture which represents the fields of knowledge available on Dialog. Just to remind you, there are 400 databases of a few million records each and one can obtain information on any subject from ion implantation to bone healing or education in Switzerland. Information is available within a few seconds or at the worst within a few minutes. You could say of course, that it's just wishful thinking, that I am theorizing. Please, come up to stand number 8 where we have a direct connection with Dialog and where at any time you can check any information.

I noticed that businessmen are especially interested. In an equally short time we can find for them a company and show its financial situation and production. And the other way round, you can find hundreds or thousands of companies in Japan, America, Australia or South Africa according to the type of production. I want to stress that again *we* shouldn't be given credit for it, as thousands of people are working on this all round the world and the information is gathered in one place, in Pal Alto.

There is also a "knowledge index" which Mr Woody Horton mentioned, saying that he wished something like that existed. You give a subject and a search is done in the database to find a sub-database. That is, a kind of database guide is provided in case we don't know where to search for information. In short it is a database of databases.

I would like to draw your attention to the software because you don't have to use broker's services to obtain information. Each of you can set up a similar service. What is needed is hardware, which each of you have, and some knowledge.

The software that Dialog supports is very user-friendly. We heard about the expert systems and this software operates on similar principles. It has an impressive menu which we can use to search for various information. The menu adapts itself to the level of our skill in operating the system. So a person completely new to information technology can sit in front of the screen and the menu will lead him/her step-by-step, while a person with more advanced skills can give a whole sentence in order to find the information s/he is looking for. (For example) "drawing-pins Pakistan produced in the last month" – and this will be found.

At this stage the cost is practically none. Furthermore, you can become a user within 14 days. However, some computer knowledge is necessary to set up the system.

I have already mentioned my misgivings with regards to the imperfection of our telecommunication links. However, I wanted to say once more, that (thanks to) modern software and hardware which enables the use of world information services (and this refers not only to Dialog but also to Kompass or Pergamon in London or German databases, Comertel communication, especially) and also municipal links which we have at our disposal at our conference are sufficient to analyse the content of the databases I mentioned.

Someone could say that those databases are expensive to use and that you are charged for searching for information. Of course you are charged for it. However, if you frequently use a certain type of information, for example about American films, ten you can buy a compact disc, on which information is updated every four months and you can make a search on a compact disc for the same type of information without any difficulty. As we could find out at our conference exhibition, this is offered by many companies, not only Dialog.

I mentioned also electronic mail which is very encouraging, because a transmission from the USA, which is often difficult, takes about three seconds. For those unfamiliar with technology, the transmission takes place at a rate of 2400 baud, which isn't slow, and is transmitted without difficulty. It takes 5 seconds for two pages of transcript to be sent and at present it costs a few cents. While already on the other side of the ocean the letter is given a stamp and sent to someone who doesn't have a PC. In my opinion it is a fantastic service.

Finally it seems worthwhile to emphasize the publishing work of Dialog, which publishes computer science handbooks. It was the first time I came across them. I have been a teacher for several years yet I was surprised to find out that already five and six year old children are taught how to use computers. Such handbooks, which are in the form of pictures and examples of which I have on the disc, are given to children who learn how to use Dialog.

There are handbooks for five to a hundred year-olds. Handbooks of various degree of difficulty. It is significant that computer studies is taught not as a science but as a tool. They speak about computers and at the same time children learn names of colours and so on. I would have to give a longer lecture on this.

Within our limited scope and I am talking now about our firm – VARMAT WIP which I represent, we offer this service. It commenced two weeks ago and that's why we couldn't organize any advertising campaign. All that I have been talking about can be checked here as soon as I leave the podium or in the few forthcoming days in Warsaw.

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Question time

Chaired by Ewa Karska, President of the Association of Polish Translators

A delegate
I would like to introduce myself. My name is Eugeniusz Makowski and I am the owner of a Polish consulting agency which has an agreement with the Federation International d'Ingenieurs et Conseir. I would like to reply to the gentleman from Holland who presented some types of programme.

I wanted to tell you that certain elements of your programme were impossible to carry out in Poland because the map, which you mentioned and which I would like to explicate later, has always been a secret. It was impossible to introduce the notion of infomapping in Poland. Yet, I would like to tell you that my office is carrying out a programme, which I would like to describe to you and which has surpassed your concept.

In my programme the layers are recorded in the computer in such a way that the layers overlap. The first layer is a computerized map of a section of a district which is the smallest local administration unit governing Poland. Furthermore we place on this map (a map of) all phenomena resulting from the monitoring of socio-economic phenomena which are necessary for the conversion from the post communist system to the market economy. Next, I place a layer illustrating the geographical conditions. Then the degree of economic development, the number of investments, the description of investment prospects and, what is a novelty, plans of general spatial development which are now being worked out so that we could include them in the harmonious development of the region and the community. Further, the distribution of the natural resources and the possibilities of their utilization, which is also new in Poland.

As an aside I wanted to tell you that the Sejm [the Polish Parliament] has recently revealed some geological data and after 5 days a few gentlemen arrived with a case full of money and in the form of a template provided information regarding sites for prospective geological research in Poland. We are already carrying out this offer in two regions of Poland. One of them is Praga Poludnie (a quarter of Warsaw), using the most modern techniques such as satellite and photogrammetric photography and so on. All the phenomena which you mentioned are dealt with in a comprehensive way in order to be able to provide true, complex and modern information so that decisions on the governmental level could be taken.

As a side-note I would like to tell you that there is a necessity to carry out reprivatization in agriculture because after independence the estates were partitioned. We need to place overlapping pictures illustrating the property distribution in 1945 and the ones illustrating the present situation, for example the maps of unemployment and so on. I will give you the details later on and I will also give you this translation.

Anyway, I am very glad that for the first time the word infomapping has appeared in Poland and I would like it to be popularized. I would like this aspect of information

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which you talked about, and in which I have been involved for 18 years, to be discovered and I would like to thank the organizers for introducing the subject of infomapping to Poland. Thank you very much.

Ewa Karska
Thank you. Would you like to make a comment?

Scott Hochstrasser
Yes, I wanted to say thank you very much for filling me in on the kinds of systems that are being developed here. I am very familiar with the information systems, we call it GIS – Geographic Information Systems – which you're developing and using. I'm looking forward to talking to you after the conference. Thank you for your comments.

Ewa Karska
Are there any further questions or comments?... I understand that there are no more questions or comments. Ladies and gentlemen, before I ask the president Mr Bogdan Chojna to give a recapitulation of our conference I would like to thank sincerely the speakers of the session over which I was presiding and those who took part in the discussion and, of course, all of you as well as my colleagues – conference interpretors. May I, please, now call on Mr Chojna to give his recapitulation.

Bogdan Chojna
Thank you Madam Chairman. I think that if one wants to be brief one will not be able to recapitulate our conference, because in order to do so one would have to say everything from the very beginning. Considering there was such a great number of subjects in which the term information, and shades of this term, were used and (considering) the amount of information about information, the only sensible thing one can suggest is a careful reading of the transcript of the conference.

I can only express my great satisfaction that so many eminent people gathered during those two days and they all had such a great knowledge of information technology. I am very pleased that we had an ample representation of administrative and political activists. We witnessed very concrete speeches from politicians and top officials, both Polish as well as representing the EEC. They were saying that quite clearly on the eve of signing the agreement on the association of Poland to the EEC. Poland undoubtedly needs an injection of technology which would facilitate access to information and its transformation. This was definitely a prevailing thought.

The other recurring thought was that the world in which we live is getting more and more complex, full of facts and phenomena which can't be a subject of a speedy analysis and with which we have to live. One of the last questions or rather the comment made by Mr Makowiecki, only signalled one of the issues playing a secondary role at the conference. It is the issue of property administration and property rights which is now extremely interesting for us. It shows how much the world has changed and how the peaceful revolution, which we experienced two years ago in Central and Eastern Europe, contributed to the increase in the complexity of life and the increase in the number of phenomena to which we somehow have to relate. This was then the other thought which was recurring, especially in the speeches of the politicians. Despite the pesimistic note, we saw a very optimistic counterpoint. Namely, the "technological" part. That is, the presentation of the technological solutions which help to find a way and to operate in the world, in which information comes in a flood and drowns, especially those who have to take decisions.

Consequently, without going into the details of any of the speeches, I can only express my joy and satisfaction. First of all my thanks to all of you. Thanks, first of all, for giving us your time. I think that in today's world, time is just as valuable as information. And in fact information and all the technical means serve the purpose of saving time. Rapid access to information and the possibility of making a quick decision based on appropriately prepared information aims to save effort and solve problems. I believe these are themes to which we should draw our attention. Consequently, I am pointing out to you your time spent here for which, as I say, I thank you very much.

I would like to thank all the speakers representing both policies and theories of information management as well as practical applications of the information management mechanisms. I would also like to thank all the exhibitors who are bravely manning their stands and providing additional information to those who want to learn in greater detail what is on offer. A lot is presented and these are very interesting things.

There are publications which are the most traditional form of popularizing information, both official, European as well as business oriented. There are databases presented and some of them are online databases. Also technical means are presented such as computers and electronic equipment for the storage, transformation and transmission of information. The exhibition also seems to me an extremely interesting point in our event and I hope the exhibitors can hear me now.

I would also like to thank our colleagues and organizers. First of all, let me thank Aslib from London, an organization which, as I mentioned yesterday, is involved in the management of information. The fact that so many eminent specialists, both in the theory and practice of information management, gathered in Warsaw is something for which, I believe, we have to thank Mr Roger Bowes, the executive director of Aslib. I would also like to thank the Polish Association of Translators and Interpretors, which greatly contributed to the organization of the technical side of this event and which provided interpreters. Being a translator/interpreter [1] myself and a member of the Polish Association of Translators and Interpreters I would like to thank very much my colleagues/interpreters for their effort.

I would also like to thank all the technicians and all the remaining organizers, that is, the EEC Centre for European Studies of the Warsaw University, EUR-OP, Interberbum – a translating agency from Sweden represented by Mr Cynkin as well as one of our allies in Poland – the British Council. Altogether there are quite a few organizations – is in fact seven — but it is a lucky number and I am sure it spells a success for Euroinfo '92, to which I would like to invite you once more.

[1] There is no differentiation in Polish between the terms "and interpreter" and "a translator"

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Information science in the international arena: an educator's perspective

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Caveat lector

Over the last decade or so I have had first-hand experience of sixty LIS (library and information science) schools or programmes in twenty countries, from Botswana to Brazil; from Morocco to Malaysia. This paper describes my impressions of recent and current developments in the teaching of information studies/science internationally. It is not, however, based on the results of any kind of field survey or systematic comparison of curricula and courses, and my remarks should therefore be treated with caution. These impressions have been garnered through on-site visits, whether for the purpose of teaching, acting as external examiner, conducting research or undertaking consultancy assignments.

In some cases I have been actively involved as a team member in the design and launch of a programme (e.g. Unesco's regional programme in information studies hosted by the University of Simon Bolivar in Venezuela; the Master's programme in information studies under development at the National Autonomous University of Mexico); in others I have acted as a facilitator or resource person (e.g. for the one year specialization programme in information management at the Federal University of Minas Gerais in Brazil) and in others as a sounding board (e.g. the information management programme being set up in Hungary by Omikk, the National Technical Information Centre and Library, in association with the Gymnasium for Management Business Schools in Rome). Relevant experience closer to home includes the establishment of both a Master's degree in information management (1986) and an undergraduate programme in information science (1988) at the University of Strathclyde.

Putting academic reserve to one side, I would say that demand for information studies programmes is buoyant, particularly conversion type courses at the graduate level, and that the leading edge of that growth trend is located, not in the US or UK (*pace* the outstanding Schools of Information Studies at Syracuse and Sheffield Universities), but in less developed nations, where the lack of more traditional documentation courses coupled with the marginality of mainstream library science education have resulted in a supply-side vacuum. Growth in new programme formation outside the US is thus happening at a time of library school closures within the US: in recent years, the top private institutions have cashed in their LIS chips, and there is speculation that this trend (down market dumping) might extend to the next level, the top-ranked state universities.

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Whether these closures are random events or part of a pattern is not the issue[1,2]: what we are seeing is the third world leap-frogging the mature phase of library science education and proceeding directly to the post-mature stage. Given the leadership role historically provided by US LIS schools, this is an ironic and disturbing state of affairs. As the US appears to be trading down, educational institutions in other countries have instead identified fresh opportunities and responded with alacrity and imagination.

The other path

Many less developed or newly industrialized nations do not have an LIS pedigree, or if they do, it is less than distinguished. Furthermore, in some cultures (Spanish, German, French, for example – not to mention English) the word "library" is burdened with negative connotations and generates weak expectations in the marketplace. On occasion, overseas colleagues tell me that they want to market-position their product, be it course or curriculum, in such a way that it is not confused or associated with the baggage of traditional librarianship. Perceptions, of course, are neither right nor wrong: they are simply perceptions. Yet, there seems to be an almost universal view that traditional LIS programmes are essentially reactive, process-oriented, and library-based, while the newer, post-mature programmes are client-centred and proactive in character. But we must be careful not to present the issue in crude dialectic terms,

Take the case of Peru, with its desperate need for adult literacy programmes, professionally qualified public librarians (there are currently eight for the entire country), and basic library facilities. The two LIS schools in Lima at the Catholic University and the University of San Marcos will continue to have an important contribution to make, but, in addition, the country needs to develop a cadre of information professionals who can play their part in the process of economic restructuring and market development, as Peru struggles to break with its mercantilist past. Arguably, it is the accelerating transformation of the world economy (at the global, regional and national levels) which has triggered the extra-territorial wave of interest in developing innovative information studies programmes outside and around heartland LIS institutions.

Let me illustrate what I mean with a few examples. A couple of years ago I taught a course on information marketing in Portugal, as part of a carefully conceived initiative to train a cohort of business/industrial information specialists (competitively selected graduates from a range of disciplines) who would subsequently be scattered across the country to seed information awareness. In the words of the programme director:

> *The development of the knowledge industries depends heavily on the availability of well-trained information professionals, alerted not only to the processes and procedures involved in the transfer of knowledge, but also aware of the continuous new capacities available to this area through the development of information technologies. The recognition of this led to the introduction of a postgraduate training programme to prepare information intermediaries who would support the transfer of knowledge to business in Portugal.*[3]

Portugal is not alone in recognizing the need to develop a more robust information infrastructure and to raise levels of information literacy and awareness. In this, as in much else, Yugoslavia has had a chequered recent history:

> *There are several reasons why the information society in Yugoslavia is now in a state of under-development. One is resistance to change, especially in the management structure. Second is the labour market and the status of the information profession. The third is education, the role which information technology has in the curriculum, education for information use, and finally, attitudes of teachers who are supposed to create awareness of the importance of informatization in the student population.*[4]

The rationale for the recently announced programme in information management set up by Omikk in Budapest is rooted in *perestroika*. The shift from a command to market economy will be painful and complex for former Comecon countries like Hungary and Poland. The old rules disappear with the *ancien regime*, to be replaced by new rules, new players and an entirely new playing field. The emergence (not just in Europe, but also in Latin America) of new markets brings new threats and new opportunities; it also puts a premium on high-grade information and intelligence for trade, business negotiations, and ultimately for the protection of sovereign interests, something the Hungarians clearly recognize:

> *In the present circumstances it is vital for Hungary to produce domestic and import foreign business information to build up its market-oriented economy and to meet the conditions of the single European Market. The efficacy of business information activity depends on the development of information management capability.*[5]

Local content and control

Dominant though the market mentality is, there are other perspectives which are beginning to influence our understanding of how information relates to social development. The models which infuse the thinking of the School of Library and Information Studies at the University of Botswana stress national and regional self-reliance through more effective management of indigenous resources:

> *To see Africa's future information needs in the context of social intelligence moves us clearly apart from old preoccupations ... A social intelligence model for the continent places self-reliance at the centre ... it involves taking control of its own indigenous knowledge base, and using it to seek development solutions more appropriate to its needs ... Africa does not at present even know itself in its own terms, but by reasserting the significance of the indigenous knowledge base and placing it in a social intelligence framework, the continent can set about taking control of its own destiny.*[6]

Just as in manufacturing industry, where a foreign direct investor may be required to satisfy local content rules, there is clear evidence that developing countries are determined to have a say in what goes into the educational mix and to put an end to the wholesale transplanting of "designer curricula" and "boutique programmes". Horowitz's comments on the Latin American experience find their echo in other parts of the world:

Many of the so-called "reforms" consisted of modifications of the study program by changing the names of the courses and lengthening their duration to reflect the course schedules of foreign schools, mostly those of the United States'.[7] In recent years, there has been a backlash against Westernization, fuelled in part by the cry for a New World Information and Communication Order (NWICO), and we are now seeing a determined effort on the part of many LDCs to develop import substitution strategies in the information science/studies domain.

In rural Africa, where the majority of the population is illiterate or semi-literate, and has little access to print

> *... an information service should be planned and implemented in a way that is appropriate for the local community. In most cases, the service should be developed within the local community ... rural people's time and work cannot be taken for granted ... If information professionals wish to introduce new services, including libraries, to serve development in rural areas, they must first gain the acceptance of those who are currently the local information intermediaries.*[8]

The particular rhythms of rural life in Africa, the centrality of oral communication, the endemic lack of basic information resources and massive language fragmentation are just some of the difficulties which need to be addressed. It is questionable whether Western models and professors are always wholly appropriate in such a situation. Indeed, I am reminded of remarks made by Elisabeth Davenport to the effect that the shoals of 'crats', 'onomists' and 'ologists' we export to the third world may be as much a part of the problem as the solution; a classic case of iatrogenic dysfunction.

The need for sensitivity to local culture and context is so obvious that it almost needs no stating. Yet we all have our blind spots. A couple of years ago during an information management curriculum planning session at the Federal University of Minas Gerais I was curious to know why the tabled proposals included a class on semiotics. Basically, the intention was to train students in the art of interpretation: how to pick up cues, decode political utterances and manifestos, identify and make sense of weak environmental signals, and, literally, in many cases, how to read between the lines (media ownership in Brazil is highly concentrated and news coverage all too easily manipulated). That experience convinced me that any information studies programme worthy of the name should incorporate a social hermeneutics component.

I also remember an ECA (Economic Commission for Africa) seminar where my presentation on strategic information management was greeted with undisguised antipathy by one North African delegate who protested vehemently that 'the language of Wall Street' was totally out of place in such a colloquium and an insult to the assembled pan-African congregation. It was not the first occasion I had encountered that particular strain of neo-colonialist criticism, but this time I chose to disagree with my interlocuter. Given the theme of the seminar, I had deliberately rooted my presentation in the context of international markets and the role played by information in conferring competitive edge. In some cases, the only way to survive is to play the other guy at his own game. To ignore the lessons of the first world, when attempting to compete against first world companies in open markets, is myopic in the extreme. The alternative is to decouple economically, in which case my language and box of business tricks can, of course, be dismissed as ideologically suspect. But as the adage goes, you can't have your cake and eat it.

Programme typology

In most countries the population of LIS schools and programmes is so small or so variegated that generalizations are ill-advised, while international comparisons are hampered by the fact that the basic concepts and structures often have relatively little in common, thus making it difficult to compare like with like: 'Tradition, legislative practices, educational policies, professional expectations, environmental demands, institutional politics and finance all in some way shape and constrain innovation within individual countries and contexts.'[9] This point has also been made in the context of discussion surrounding library school closures in the US: 'Each library school closing is a unique event with its own cast of characters ...'[10] Nonetheless, I would like to elaborate a simple typology which I shall use as a platform for speculating on the shape of things to come. The classification comprises four kinds of academic programme: boutique, broad church, niche, tree hugger.

Boutique

Boutique programmes are essentially market-led; they are a response to felt need or expressed demand from the external environment. As a rule, they are unlikely to emerge in a traditional LIS school. Indeed, they need not be institutionally defined (they could be hosted by a research agency or established and funded through a special government initiative) and may have a short life-span. In the worst case, they will exhibit the side effects of "espresso" curricula, and may well prove to be "fashion victims". In the best cases, they will be a stimulus to other players, old and new, in the educational marketplace. Omikk's information management proposals fall into the boutique category, as does the specialized "information for industry" course organized by LINETI in Portugal.

Broad church

The distinguishing features of the broad church are (a) catholicity, (b) critical mass, (c) harmony, and (d) synergy seeking. The members of this group will be drawn from the largest and most robust of today's LIS schools: those schools with the intellectual base to sustain broadband teaching and research across the LIS spectrum: from archiving, conservation and preservation through publishing, information science and librarianship to information management and information policy. Small countries (e.g. Sweden, Denmark) with a national school are logical members of this group, though their virtual monopoly position can sometimes translate into excessive conservatism. There are, however, other candidates; for example, Loughborough University's Department of

Information and Library Studies in the UK, or the rainbow coalition that is the School of Communication, Information and Library Studies at Rutgers University.

Niche

This group embraces LIS and non-LIS schools which have chosen to position their programmes in such a way as to achieve clear differentiation and strong brand image. In certain cases (e.g. Syracuse University School of Information Studies), these programmes will be seen as pace-setting. Niche programmes are potentially high-risk, but also potentially high yielding in terms of fee income, grant awards and institutional kudos. As the market becomes increasingly competitive, greater specialization (i.e. playing to and building on one's strengths, whether in records management, information retrieval or strategic information systems management) may well be seen as an attractive option. The best of this breed will be instrumental in redefining the boundaries of the field.

Tree hugger

This category is for those schools or programmes which refuse to move with the times, or fail to respond to prompts from either the marketplace or university administrators to review their mission and intellectual underpinnings. These institutions are characterized by strategic drift, technological retardation, excessive institutional focus and biliocentrism. But I shall avoid naming names for fear of a libel action!

Speculation

Consider each of these four categories now in terms of (a) market responsiveness, (b) intellectual thrust, (c) strategic drift/vulnerability, and (d) growth potential and survivability. Almost by definition, boutique programmes (and, to a lesser extent, niche programmes) are the most market responsive. Tree huggers are just the opposite, while the "clock time" of broad church schools is slower than that of either boutique or niche programmes. As a general rule, the richest intellectual environment will be found in either the leading-edge niche schools or in the more self-aware broad church environments. In both cases, faculty will be interacting with peers inside and outside their disciplines/programmes/schools/institutions/countries, questioning and seeking to consolidate the intellectual bases of the field. The most vulnerable programmes are likely to be those experiencing the highest levels of strategic drift (tree huggers) or those most exposed to shifts in intellectual fashion, changes in the market-place or the vagaries of academic politics; niche programmes, in other words.

And the schools/programmes which are most likely to endure? If I were a betting type, I would back the broad church model, because, in spite of its limitations, it is the only variant which combines solidity and continuity with intellectual ecumencism and the ability for incremental self-renewal. Boutique programmes will flare up and die away, as opportunities arise. A few may eventually become institutionalized and even metamorphose into a niche or proto-broad church type of programme. Some of the more solid niche programs will become permanent features of the academic landscape, existing independently of the heartland LIS community and developing closer intellectual and professional ties with other academic tribes (e.g. communication studies, business computing, telecommunications). And the tree huggers? Well, they will just carry on hugging until someone uproots the tree.

Structural change

As far as the USA is concerned, we can expect rolling closures and emergent stratification, with consolidation and concentration at the top end of the market. Some programmes will continue, but in a different host environment and in different form. Envelopment will become commonplace: a decade of hostile take-overs, mergers, strategic alliances and marriages of convenience lies ahead.

The 1980s were the years of head-to-head competition and high-profile *slugfests* in the business world. Things have changed to some extent: joint ventures and strategic alliances are the order of the day. The watchwords of the nineties are competitive co-operation, planned partnerships and social networks. There are lessons to be learned from all of this.

The on-going shake-out of US library schools will stimulate closer co-operation between institutions. In the US, there is already a number of more or less formal groupings, based on geography, perceived leadership status, or common ideology. The next decade will witness a growing inter-dependency among schools and the formation of new coalitions. In some cases, this should translate into improved leverage in the areas of grantsmanship and better across-the-board utilization of distributed resources (e.g. courseware, professional expertise, technology).

This model could be applied internationally. One important effect of the new communication technologies has been the progressive erosion of 'geographical determinism'.[11] Even in the short time that I have been involved in international programmes and exchange schemes, the scope for collaboration has improved enormously thanks to fax and e-mail, not to mention live audio and audio-visual satellite link-ups. As the scope and reliability of the technical infrastructure grow, it becomes easier for academic partners to consolidate and build on the results of staff (and student) exchanges. Having managed a number of British Council-funded academic link programmes over the last few years, with universities in Madrid, Zagreb, Melbourne, Minas Gerais and Mexico City, I can appreciate the real qualitative difference made by advances in communication technologies. For this and other reasons, I predict a growth in North-South coalitions, based on healthy reciprocity rather than continuing cognitive dependence.

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